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PATENT
Attorney Reference Number 7273-70199-01

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ewing et al.

Application No. 09/930,780

Filed: August 15, 2001

Confirmation No. 3325

For: VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP

Examiner: Ashokkumar B. Patel

Art Unit: 2154

Attorney Reference No. 7273-70199-01

CERTIFICATE OF MAILING

I hereby certify that this paper and the documents referred to as being attached or enclosed herewith are being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: MAIL STOP APPEAL BRIEF - PATENTS, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date shown below.

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TRANSMITTAL LETTER

Enclosed for filing in the application referenced above are the following:

☒ Appeal Brief.

- ☒ Copies of the application as filed and formal drawings are attached hereto.
- ☒ Copies of entered Amendments in this case, filed February 28, 2005 and May 6, 2005.
- ☒ Copies of the references relied upon by the Examiner and include the following:
  - ☒ U.S. Patent No. 5,424,903 ("Schreiber");
  - ☒ U.S. Patent No. 6,476,729 ("Liu"); and
  - ☒ U.S. Patent No. 5,619,722 ("Lovrenich").

☒ The Director is hereby authorized to charge any additional fees that may be required, or credit over-payment, to Deposit Account No. 02-4550. A copy of this sheet is enclosed.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By [signature]
Justin D. Wagner
Registration No. 54,519

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 595-5300
Facsimile: (503) 595-5301

cc: Client
Docketing

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of: Ewing et al. Application No: 09/930,780 Filed: August 15, 2001 For: VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP Examiner: Ashokkumar B. Patel Art Unit: 2154	**CERTIFICATE OF MAILING** I hereby certify that this paper and the documents referred to as being attached or enclosed herewith are being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: MAIL STOP APPEAL BRIEF - PATENTS, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date shown below. Attorney or Agent for Applicant(s) J. D. Wagner Date Mailed November 14, 2005

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APPEAL BRIEF
IN SUPPORT OF APPELLANTS' APPEAL
TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

This brief follows the Notice of Appeal filed September 8, 2005 (received by the PTO on September 12, 2005), in connection with the above-identified application. Appellants respectfully request consideration of this brief for allowance of the present application.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The present U.S. Patent Application is assigned to Server Technology, Inc., of 1040 Sandhill Drive, Reno, Nevada, 89521.

II. RELATED APPEALS AND INTERFERENCES

There are no appeals, interferences, or judicial proceedings known to Appellants, Appellants' legal representative, or the assignee that may be related to, directly affect or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-9 have been canceled.

Claims 10-32 are pending in the present application, were rejected in the Final Office Action mailed June 9, 2005, and are the subject of this appeal. Claims 10, 11, 13, 15, 16, 18, 20, 22, 24, 25, 27, 29, and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent No. 5,424,903 to Schreiber (hereinafter "Schreiber") in view of U.S. Patent No. 6,476,729 to Liu (hereinafter "Liu"). Claims 12, 14, 17, 19, 21, 23, 26, 28, 30, and 32 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Schreiber and Liu and further in view of U.S. Patent No. 5,619,722 to Lovrenich (hereinafter "Lovrenich").

All pending claims 10-32 are being appealed.

IV. STATUS OF AMENDMENTS

In response to the Final Office Action mailed June 9, 2005, Appellants filed a Notice of Appeal on September 8, 2004. A copy of all claims on appeal is attached hereto as Section VIII (CLAIMS APPENDIX).

V. SUMMARY OF CLAIMED SUBJECT MATTER

Claim 10 is an independent claim directed to an electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination a vertical strip enclosure having a thickness, and a length that is longer than a width of the enclosure (*see, e.g.,* Specification, page 1, lines 9-20; and FIG. 1, reference character 102); a power input penetrating said vertical strip enclosure (*see, e.g.,* Specification, page 1, lines 14-15; and FIG. 1, reference character 108); a plurality of power outputs disposed along a face of said length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads (*see, e.g.,* Specification, page 1, lines 16-18; and FIG. 1, reference characters 111-126); a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs (*see, e.g.,* Specification, page 13, line 29, to page 14, line 18; and FIGs. 4A and 4B, reference characters 401-404 and 421-424); and a user display disposed on said vertical strip enclosure and adjacent to the plurality of power outputs in information-determining communication with at least one among said

power input and said plurality of power outputs, said user display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs (*see, e.g.,* Specification, page 1, lines 18-20; and FIG. 1, reference character 104).

Claim 11 depends from claim 10 and recites that the electrical power plugstrip of claim 10 further comprises at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 12 depends from claim 11 and recites that the electrical power plugstrip of claim 11 further comprises an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs (*see, e.g.,* Specification, page 6, lines 17-24; and FIG. 2).

Claim 13 depends from claim 10 and recites that the electrical power plugstrip of claim 10 further comprises a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 14 depends from claim 13 and recites that the electrical power plugstrip of claim 13 further comprises an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power

manager may control power provided to selectable ones of said plurality of power outputs (*see, e.g.,* Specification, page 6, lines 17-24; and FIG. 2).

Claim 15 depends from claim 10 and recites that the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device (*see, e.g.,* Specification, page 15, line 35, to page 16, line 10; and FIG. 6).

Claim 16 depends from claim 13 and recites that the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device (*see, e.g.,* Specification, page 15, line 35, to page 16, line 10; and FIG. 6).

Claim 17 depends from claim 14 and recites that the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device (*see, e.g.,* Specification, page 15, line 35, to page 16, line 10; and FIG. 6).

Claim 18 depends from claim 11 and recites that said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 19 depends from claim 12 and recites that said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 20 depends from claim 13 and recites that each said intelligent power

section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 21 depends from claim 14 and recites that each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 22 depends from claim 16 and recites that each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 23 depends from claim 17 and recites that each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 24 is an independent claim directed to an electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination a vertical strip enclosure having a thickness, and a length that is longer than

a width of the enclosure (*see, e.g.,* Specification, page 1, lines 9-20; and FIG. 1, reference character 102); a power input penetrating said vertical strip enclosure (*see, e.g.,* Specification, page 1, lines 14-15; and FIG. 1, reference character 108); a plurality of power outputs disposed along an area on a face of said length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads (*see, e.g.,* Specification, page 1, lines 16-18; and FIG. 1, reference characters 111-126); a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs (*see, e.g.,* Specification, page 13, line 29, to page 14, line 18; and FIGs. 4A and 4B, reference characters 401-404 and 421-424); and a digital display disposed on another area of said vertical strip enclosure and adjacent to said plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, said digital display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs (*see, e.g.,* Specification, page 1, lines 18-20; and FIG. 1, reference character 104).

Claim 25 depends from claim 24 and recites that the electrical power plugstrip of claim 24 further comprises at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 26 depends from claim 25 and recites that the electrical power plugstrip of claim 25 further comprises an external power manager application external to the vertical

strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs (*see, e.g.,* Specification, page 6, lines 17-24; and FIG. 2).

Claim 27 depends from claim 24 and recites that the electrical power plugstrip of claim 24 further comprises a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 28 depends from claim 27 and recites that the electrical power plugstrip of claim 27 further comprises an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs (*see, e.g.,* Specification, page 6, lines 17-24; and FIG. 2).

Claim 29 depends from claim 25 and recites that said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 30 depends from claim 26 and recites that said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 31 depends from claim 27 and recites that each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

Claim 32 depends from claim 28 and recites that each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay (*see, e.g.,* Specification, page 14, line 34, to page 15, line 7; and FIG. 5).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 10, 11, 13, 15, 16, 18, 20, 22, 24, 25, 27, 29, and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Schreiber in view of Liu.

Claims 12, 14, 17, 19, 21, 23, 26, 28, 30, and 32 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Schreiber and Liu and further in view of Lovrenich.

VII. ARGUMENT

A. DURING EXAMINATION, THE CLAIMS MUST BE CONSTRUED, THE EXAMINER MUST MAKE A PRIMA FACIE CASE OF OBVIOUSNESS, AND THE FINAL LEGAL CONCLUSION OF OBVIOUSNESS MUST BE CORRECT.

During patent examination, a claim must first be correctly construed to define the scope and meaning of each contested limitation. *In re Skinner*, 2 USPQ.2d 1788, 1788-

89 (B.P.A.I. 1986). Claims must be "given their [1] broadest reasonable interpretation [2] consistent with the specification." *In re Hyatt*, 211 F.3d, 1367, 1372, 54 USPQ.2d 1664, 1667 (Fed. Cir. 2000).

After the claims have been construed, the Examiner must establish a *prima facie* case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ.2d 1443, 1444 (Fed. Cir. 1992). To establish a *prima facie* case of obviousness, the Examiner must show some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. "In determining the propriety of the Patent Office case for obviousness in the first instance, it is necessary to ascertain whether or not the reference teachings would appear to be sufficient for one of ordinary skill in the relevant art having the reference before him to make the proposed substitution, combination, or other modification." *In re Linter*, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). Second, there must be a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 903-904, 7 USPQ.2d 1673, 1681 (Fed. Cir. 1988). Third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *Velander v. Garner*, 348 F.3d 1359, 1368, 68 USPQ.2d 1769, 1780 (Fed. Cir. 2003). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ.2d 1438 (Fed. Cir. 1991).

If the Examiner has made out a *prima facie* case of obviousness with properly construed claims, the Office must consider the applicants' response. The Office must then determine whether Examiner's *prima facie* case has been rebutted, and the legal

conclusion of obviousness is incorrect on the record as a whole. *In re Kumar*, 418 F.3d 1361, 1368, 76 USPQ.2d 1048, 1050 (Fed. Cir. 2005).

The applicants submit that the Examiner misconstrued the claims; and as a result, the Office Action did not establish a *prima facie* case as a matter of law. In addition, the Office Action utilized the advantages of the claimed invention as presented by the patent specification to provide the motivation to combine the references in issue. This is classic legal error and resulted in legally erroneous hindsight picking and choosing of elements in the prior art to try to develop the claimed invention. The Office Action also failed to consider the advantages of the claimed subject as part of the subject matter as a whole under Section 103; and thus, the Office Action also erred in failing to recognize that the advantages, rather than providing a motivation to combine, show that the claimed subject matter is patentable as a matter of law.

B. THE OFFICE ACTION MISCONSTRUED, AND DID NOT APPLY, THE "ELECTRICAL LOAD," "IN A VERTICAL RACK," AND "VERTICAL STRIP ENCLOSURE" LIMITATIONS RECITED IN INDEPENDENT CLAIM 10.

Independent claim 10 recites:

> An electrical power distribution plugstrip of the type for providing power to ***one or more electrical loads in a vertical electrical equipment rack***, the electrical power distribution plugstrip comprising in combination:
>
> A. ***a vertical strip enclosure having a thickness, and a length that is longer than a width of the enclosure***;
>
> B. a power input penetrating said ***vertical strip enclosure***;
>
> C. a plurality of power outputs disposed along a face of said length of the strip enclosure, ***each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads***;

D. a plurality of power control relays disposed in said ***vertical strip enclosure***, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs ***among said plurality of power outputs***; and

E. a user display disposed on ***said vertical strip enclosure*** and adjacent to the plurality of power outputs in information-determining communication with at least one among said power input and ***said plurality of power outputs***, said user display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and ***said plurality of power outputs***.

First, limitation A above recites a "***vertical*** strip enclosure." In addition, limitation C above expressly recites the advantageous "plurality of power outputs being connectable to said one or more ***electrical loads***." The sole and express antecedent basis for "said one or more electrical loads" is in the preamble, and the preamble expressly recites that these loads are "in a ***vertical electrical equipment rack***." The claim then continues to build on this express antecedent basis by repeated subsequent reference to "said plurality of outputs," which (i) in limitation A are recited to be in a "vertical strip enclosure" and (ii) in limitation C are also recited to be connectable to the "said one or more electrical loads" – i.e., the "electrical loads in a vertical electrical equipment rack."

As the Federal Circuit has explained, the express tie of limitations in the claim to the terminology in the preamble renders this terminology in the preamble a limitation to the claim. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305-1306, 51 USPQ.2d 1161, 1165-1166 (Fed. Cir. 1999). In this case, any other rule would improperly eliminate the requisite antecedent basis for the "said one or more electrical loads" in limitation C. *Eaton Corp. v. Rockwell International Corp.*, 323 F.3d 1322, 1339, 66 USPQ.2d 1271, 1276 (Fed. Cir. 2003).

In addition, reading the claims in view of the Specification can allow no other conclusion other than that the claimed power outputs in the claimed ***vertical*** power distribution plugstrip are for connection to electrical loads in a ***vertical electrical equipment rack***:

1. The title of the present application is VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP (emphasis added).
2. The Field of the Invention section at page 1 of the present application states that the invention relates "more particularly to electrical power distribution devices and methods for conserving the primary rack-mount spaces ***in a standard RETMA [i.e., vertical] rack***" (emphasis added).
3. The Summary of the Present Invention section at page 3 of the present application states that "a ***vertical-mount electrical power distribution plugstrip*** embodiment of the present invention comprises a long, thin plugstrip body with several power outlet plugs distributed along the length of one face" (emphasis added).
4. All embodiments taught in Detailed Description and accompanying Drawings constitute a vertical power distribution plugstrip with power outlets connectable to a electrical devices in an associated vertical electrical equipment rack. *Citation.*

The Office Action erred in its claim construction of claim 10 because it did not construe the power distribution plugstrip to comprise a vertical housing with power outlets for connection to electrical loads in a vertical equipment rack. Rather, it construed the claimed subject matter to be a ***horizontal*** plugstrip and for providing power

to ***devices that are not in any rack much less in a vertical rack as required by the claims***.

For example, the Office Action states at page 4 that "Schreiber teaches an electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack (FIG. 1, element 16, FIG. 2)." The Office Action also points to elements 32a-32f of FIG. 1 (*see,* Office Action, page 5). Both Figures, however, as well as the corresponding discussion in the specification (*see, e.g.*, col. 3, line 42, to col. 5, line 29), disclose only a power strip 16 ***connected to a non-rack- mounted computer, monitor, a printer, and a lamp***. Schreiber provides no indication of anything other than these types of devices to be connected to the power strip. In fact, Schreiber states at col. 4, lines 7-9, that "outlet 32f is nonprogrammable and is be used to supply electrical power to a lamp 34 or ***other non-system device***" (emphasis added).

Simlarly, the Office Action did not even acknowledge the "vertical strip enclosure" limitation or find it met by Schreiber. Sheieber teaches and suggests nothing other than a horizontal power strip housing 16, as shown in Figure 1. Additionally, the only mention of the housing orientation in Schreiber is at column 4, lines 9-11, which states that "[t]he power strip 16 may be placed ***on the floor adjacent the wall outlet 28*** or in another convenient location." Nowhere does Shcreiber even hint at a vertical housing, much less such a housing for connection to a vertical electrical equipment rack as in claim 10.

Additionally, independent claim 10 recites "a ***user display*** disposed on said vertical strip enclosure and adjacent to the plurality of power outputs in information-

determining communication with at least one among said power input and said plurality of power outputs" (emphasis added). Schreiber fails to teach or suggest any user display, as noted in the Office Action at page 5. It also fails to disclose any user display [i] "disposed on said vertical strip enclosure" and [ii] "adjacent to the plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs" connectable to "loads in a vertical electrical equipment rack."

The Office Action asserted that Liu cures the deficiency of Schreiber by Liu's disclosure of "this limitation in FIG. 3, col. 4, line 64-col. 5, line 9" (*see,* Office Action, page 5). Liu may disclose an indicating unit 24 for indicating "electrical parameters of the power source device and the electric appliances plugged on the power source device" (*see, e.g.*, Liu, FIG. 3 and corresponding discussion at col. 4, line 64, to col. 5, line 9; and col. 1, lines 47-51). Liu, however, does not disclose any vertical strip enclosure or any connection or connectability to loads in a vertical electrical equipment rack.

The Office Action therefore erroneously construed the vertical power distribution plugstrip of claim 10 to be horizontal and with no connection or connectability to any rack mounted device at all, much less to loads in a vertical electrical equipment rack. As will be explained within, these errors were substantial because of, among other things, the distinct vertical housing and associated vertical rack environment of the claimed structure, the additional structures set forth in other limitations in the claim, and the substantial unique advantages they provide as a whole. In other words, as will be shown within, these differences in conjunction with the other limitations in the claim led to

substantial advantages not taught or suggested by the prior art, rendering claim 10 allowable as a matter of law.

C. REGARDING INDEPENDENT CLAIM 10, THE OFFICE ACTION DID NOT ESTABLISH A PRIMA FACIE CASE DUE TO ITS INCORRECT CLAIM CONSTRUCTION, ITS ERRONEOUS USE OF ADVANTAGES FROM THE SPECIFICATION TO PROVIDE THE MOTIVATION TO COMBINE, AND ITS OMISSION FROM THE CLAIMED SUBJECT MATTER AS A WHOLE THE APPLICANTS' DISCOVERY OF THE PROBLEM TO BE SOLVED AND THE ADVANTAGES RESULTING FROM THE CLAIMED COMBINATION.

As explained above, nothing in Schreiber teaches or suggests using such a vertical power strip for connection to ***electrical loads in a vertical electrical equipment rack***. The Office Action did not assert that Liu made up any such deficiency, and it does not. Similarly, although the Office Action relied upon Liu for a user display, neither Liu nor Schreiber disclose a user display as claimed: [i] "disposed on said vertical strip enclosure" and [ii] "adjacent to the plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs" connectable to "loads in a vertical electrical equipment rack." The Office Action did not assert otherwise. Consequently, the Office Action did not establish a *prima facie* case of obviousness, as it did not explain how the purported combination of Schreiber and Liu would yield the claimed subject matter. In fact, the purported combination, even if proper, does not yield the claimed subject matter. The purported combination therefore cannot render the claimed subject matter obvious as a matter of law.

The claimed subject matter is also allowable because the references fail to teach or suggest the many advantages that flow from the claimed invention. In determining the

differences between the prior art and the claims, the question under section 103 is not whether the differences ***themselves*** would have been obvious, but whether the claimed "***subject matter as a whole***" would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983); *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983). Advantages of claimed subject matter are a part of the subject matter as a whole under section 103. "The invention as a whole embraces the structure, its properties [advantages], and the problem it solves [advantages it provides]." *In re Wright*, 84 F.2d 1216 (Fed. Cir. 1988). Advantages need not be included in the specification. *In re Chu*, 66 F.3d 292 (Fed Cir 1995). "In delineating the invention as a whole, we look not only to the subject matter which is literally recited in the claim in question . . . but also to those properties of the subject matter which are inherent in the subject matter and are disclosed in the specification." *In re Antoinne*, 559 F.2d 618, 691 (CCPA 1977).

If aspects of the subject matter as a whole, such as its advantages, are not taught or suggested by cited references, the combination does not yield the claimed subject as whole and therefore cannot render the subject matter as a whole obvious as a matter of law. *See,* 35 U.S.C. § 103. In any event, evidence of advantages are part of the difference between the claimed subject matter and the prior art and must be considered in an obvious determination.

Aside from being part of the subject matter as a whole under Section 103, advantages are also inferential evidence of nonobviousness. *Preemption Devices, Inc. v. Minnesota Mining and Mfg. Co.*, 732 F.2d 903 (Fed. Cir. 1984). "Focusing on the obviousness of substitutions and differences, instead of on the invention as a whole, is a

legally improper way to simplify the often difficult determination of obviousness." *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F. 2d 720 (Fed. Cir. 1990). The PTO is "obligated to consider all the evidence of the properties of the claimed invention as a whole, compared with those of the prior art." *In re Dillon*, 991 F.2d 688 (Fed. Cir. 1990) (en banc), cert. denied 500 U.S. 904 (1991). Thus, "[t]he relevance of such evidence [i.e., of advantages] is direct [under Section 103] in the sense that the new function [i.e., advantage] is [sic, can be] a part of the inventive concept, the 'subject as a whole,' which must be obvious under Section 103." Chisum, *Intellectual Property, Copyright, and Trademark,* 7-103, 104 (1980) (cited in Chisum's treatise on Patents at Sectin 5.03[5]). Advantages are part of the differences between the claimed invention and the prior art to be considered under the analysis articulated in *Graham v. John Deere Co. In re Dillon*, 991 F.2d 688 (Fed. Cir. 1990) (en banc), cert. denied 500 U.S. 904 (1991).

Discovery of a problem to be solved also is part of the subject matter as a whole and differences between the claimed subject matter and prior art. *Eibel Process Co. v. Minnesota & Ontario Paper Co.*, 261 U.S. 45, 67-78 (1923). "[A] patentable invention may lie in the discovery of a source of a problem even though the remedy may be obvious once the source of a problem is identified. This is *part* of the 'subject matter as a whole" which should always be considered in determining the obviousness of an invention uder 35 U.S.C. Section 103. . . ." *In re Sponnoble*, 405 F.2d 578, 585-86 (CCPA 1969).

One exemplary advantage of the claimed subject matter is the ability to monitor, through the claimed "user display" on the claimed "vertical housing" connectable to loads in a vertical rack, information "related to the amount of current flowing through at

least one among the power input and said plurality of power outputs." Claim 10. Previously, technicians working with electrical equipment racks (e.g., RETMA racks) had no way of knowing at the rack, without going to extraordinary and unusual lengths, how much current would change when a network appliance is plugged in and turned on or if the rack had gone down (*e.g.*, due to a defect in the power distribution unit or elsewhere). As the Specification further states, at page 5, lines 21-26:

> The total input current display 104 can be used to advantage by a technician when installing or troubleshooting a RETMA equipment rack by watching how much current change is observed when each network appliance is plugged in and turned on. Unusually high or low currents can indicate particular kinds of faults to experienced technicians.

The applicants submit that they were the first to discover the underlying problem created by the pre-existing, long-standing need for a technician to have to deal with a PC or other monitoring device at a location other than on the power distribution plugstrip in the environment of a vertical power distribution plugstrip and vertical electrical equipment rack. Thus, the applicants then developed the claimed subject matter to provide advantages by use of the claimed subject matter (i) to monitor information related to current information by looking only at the vertical plugstrip and (ii) without need for additional equipment of the prior art systems in the claimed environment.

Additional exemplary advantages of the claimed subject matter include: (i) by use of the vertical plugstrip housing, freeing up vertical rackmount space for other equipment, (ii) through the claimed power control relays, independently controlling the operating power to electronic appliances in a vertical rack, and (iii) reducing the need for enterprise network operators to dispatch third party maintenance vendors to remote

equipment rooms and POP locations simply to power-cycle failed network appliances (*see, e.g.,* Specification, page 3, lines 10-24).

The Office Action did not cite any of these factors – the applicants' discovery of the problem to be solved and the resulting advantages – as part of the claimed subject matter as a whole under Section 103. On the contrary, the Office Action acknowledged undefined advantages of the claimed subject matter but did not acknowledge the source of the advantages being the applicants' specification, not the cited references (*see,* Office Action, page 5). The Office Action thus failed to establish a *prima facie* case of obviousness, as it failed to consider the applicants' discovery and the advantages as part of the claimed subject matter as a whole. Moreover, as discussed above, since these factors are not taught or suggested by the asserted references, the claimed subject matter as a whole is allowable over the references as a matter of law.

The claimed subject matter is also allowable because the record provides no motivation or suggestion to combine the references. "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination." *In re Geiger*, 815 F.2d 686, 2 USPQ.2d 1276, 1278 (Fed. Cir. 1987). As noted above, the Office Action states that the motivation to make the combination is provided by the advantages of the claimed subject matter – advantages that were not taught or suggested by the references but were rather only taught by the present application or otherwise the result of the claimed subject matter. Rather than finding a proper suggestion or motivation in the references or in the common knowledge of those of ordinary skill at the time of the invention, the Office Action used on the road map provided by the claimed invention and specification to

selectively choose pieces from prior art references to try to find a motivation and build the claimed subject matter.

The result was not only less than the claimed subject and subject matter as whole but also a classic application of hindsight contrary to law. *Ecolochem, Inc. v. Southern California Edison Co.*, 227 F.3d 1361, 1372, 56 USPQ.2d 1065, 1073 (Fed. Cir. 2000). Moreover, were such an analysis proper, every advantageous invention would be unpatentable.

The applicants submit that the prohibition on hindsight reconstruction is merely another way of saying that the record must provide a proper motivation or suggestion to combine. The Office Action cited no such motivation or suggestion, and for yet another reason the Office Action did not make out a *prima facie* case of obviousness.

The applicants submit that the Office Action did not cite any such motivation or suggestion because there is none. For yet another reason, Claim 10 is allowable as a matter of law. *Id.*

Furthermore, not only is there no positive evidence of motivation to combine the references, but in fact the evidence is that there was no motivation to combine. For example, the prior art systems already had structures for reporting current-related information through a power manager. In other words, the prior art taught away from the need for, or advantages to be achieved from, including a display on the on the vertical strip enclosure itself. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference . . . would be lead in a direction divergent from the path taken by the applicant." *In re Gurley*, 22 F.3d 551 (Fed. Cir. 1994). That is why the

prior art did not include such displays for a long period of time, and it was not until the applicants' invention that the advantages to be achieved from it became apparent.

In sum, claim 10 is allowable as a matter of law because of the improper claim construction and lack of *prima facie* case of obviousness. Even assuming proper claim construction and a *prima facie* case, Applicants have still rebutted the conclusion of obviousness based on the asserted combination's inability to yield the claimed subject matter, the applcants' discovery of the problem to be solved, and the absence of any teaching or suggestion of the many advantages of the claimed subject matter, the lack of motivation or suggestion to combine the references in the record, and the classically erroneous application of hindsight to make the purported combination from Schreiber and Liu.

D. DEPENDENT CLAIMS 11, 13, 15, 16, 18, 20, AND 22 ARE ALLOWABLE BECAUSE THEY DEPEND FROM ALLOWABLE CLAIM 10.

Claims 11, 13, 15, 16, 18, 20, and 22 depend directly or indirectly from independent claim 10. Because dependent claims include the limitations of the claims from which they depend, Appellants submit that dependent claims 11, 13, 15, 16, 18, 20, and 22 are patentable over Schreiber in view of Liu for at least the reasons set forth above.

Additionally, dependent claims 11, 13, 18, 20, and 22 recite respective limitations that make each separately patentable. The patentability of each of these claims is argued separately below.

1. Dependent Claim 11 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 11.

The cited combination of references fails to teach or suggest the electrical power distribution plugstrip of claim 11 further comprising "at least one ***intelligent power section*** disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays" (emphasis added).

Reading claim 11 in view of the Specification can allow no other conclusion other than that the claimed intelligent power section is an ***intelligent power module (IPM)*** that includes a microcontroller and independently controls operating power to electrical loads in a vertical electrical equipment rack:

1. FIG. 1 illustrates four IPMs 128, 130, 132, and 134 controlling groups of power outlet sockets 111-114, 115-118, 119-122, and 123-126, respectively (*see,* Specification, page 5, line 35, to page 6, line 4).
2. FIG. 3 illustrates four IPMs (controller boards 302, 304, and 306). "Each power controller board independently stores user configuration data for each of its power control ports" (*see,* Specification, page 12, lines 19-22).
3. FIG. 4A illustrates four IPMs (single-point relay boards 401-404) that "are able to independently control the operating power flowing to various pieces of network equipment and other appliances" (*see,* Specification, page 13, lines 30-34).
4. FIG. 4B illustrates four IPMs (four-point relay boards 421-424) that "independently control the operating power flowing to sixteen pieces of network equipment and other appliances" (*see,* Specification, page 14, lines 3-

6). "Each relay board 421-424 includes a PIC-microcontroller . . . that controls the serial communication interface with the power manager 426" (*see,* Specification, page 14, lines 19-22).

5. FIG. 5 illustrates an IPM 500 "for controlling several loads with dry-contact relays" that "provides for an alarm to alert when too much current is being demanded by one or all of the loads together" (*see,* Specification, page 14, line 34, to page 15, line 1). The IPM 500 includes a serial input/output interface 504, a microprocessor 506 having a non-volatile program memory 508, and a set of dry contacts 510 that are generated from serial data (*see,* Specification, page 15, lines 1-4). "An over-current alarm 512 can issue an external alarm and/or report such condition over the serial communication channel 514 to a user display 516 or over a network interface controller (NIC) 520" (*see,* Specification, page 15, lines 4-7).
6. FIG. 8 illustrates a 4-port IPM that includes a set of four power control channels 801-804 and a microcontroller 806. "Each power control channel 801-804 includes an input control opto-isolator 808, a single-pole, double throw (SPDT) relay 810, and an output opto-isolator 812" (*see,* Specification, page 18, lines 12-15).

The Office Action erred in its claim construction of claim 11 because it did not construe the intelligent power section to be an IPM. Rather, it construed the claimed subject matter to be simple outlet/relay combinations. For example, the Office Action at page 6 cites Schreiber at col. 4, lines, 6-9 ("The outlets 32a-32e are programmable. The outlet 32f is nonprogrammable and is be used to supply electrical power to a lamp 34 or

other non-system device.") and FIG. 2, elements 46a-46e, which are "normally-open relay switches" (*see,* Schreiber, col. 4, lines 19-23). Schreiber provides no indication, however, that these outlet/relay combinations each ***include a microcontroller*** or ***independently control operating power to electrical loads***.

In this regard, none of the simple outlet/relay combinations of Schreiber include a microcontroller. In fact, the only mention of any possible microcontroller component in Schreiber is the sole microprocessor 40 in FIG. 2. The microprocessor 40, however, is external to and not a part of any of the outlet/relay combinations. FIG. 2 illustrates this fact.

Additionally, the outlet/relay combinations of Schreiber do not independently control operating power to electrical loads in a vertical electrical equipment rack. First, Schreiber actually teaches away from independent control at col. 4, line 34-36: "the flow of electricity to the common mode filters 44a-44c is regulated by the master relay" 42 which, like the microprocessor 40, is external to the outlet/relay combinations. "The microprocessor 40 controls the flow of electricity to the outlets 32a-32e..." (*see,* Schreiber, col. 4, lines 61-64). The flow of electricity to each outlet is thus controlled by the external microcontroller and not the outlet/relay combinations. Second, as discussed above with respect to claim 10, Schreiber does not even hint at providing power via the claimed vertical housing structure to electrical loads in a vertical electrical equipment rack much less independently controlling operating power to each of them.

As explained above, nothing in Schreiber teaches or suggests an intelligent power section as required by claim 11. The Office Action did not assert that Liu made up any such deficiency, and it does not. Thus, the purported combination, even if proper, does

not yield the claimed subject matter and, therefore, cannot render the claimed subject matter obvious as a matter of law.

In sum, claim 11 is allowable as a matter of law because of the improper claim construction and lack of *prima facie* case of obviousness. Even assuming proper claim construction and a *prima facie* case, Applicants have still rebutted the conclusion of obviousness based on the asserted combination's inability to yield the claimed subject matter, the advantages provided by the claimed subject matter, and the evidence of nonobviousness.

2. Dependent Claim 13 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Sections Limitation of Claim 13.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach or suggest the electrical power distribution plugstrip of claim 13 further comprising "a plurality of ***intelligent power sections*** disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs" (emphasis added).

The claimed structure of claim 13 provides additional advantages as well. For example, having a plurality of intelligent power sections provides greater power management of a vertical electrical equipment rack by providing independent control of operating power to each of a plurality of power outputs.

3. Dependent Claim 18 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 18.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

4. Dependent Claim 20 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 20.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach "an ***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

5. Dependent Claim 22 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 22.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs

for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

E. REGARDING INDEPENDENT CLAIM 24, THE OFFICE ACTION DID NOT ESTABLISH A PRIMA FACIE CASE DUE TO ITS INCORRECT CLAIM CONSTRUCTION, ITS ERRONEOUS USE OF ADVANTAGES FROM THE SPECIFICATION TO PROVIDE THE MOTIVATION TO COMBINE, AND ITS OMISSION OF THE ADVANTAGES FROM THE CLAIMED SUBJECT MATTER AS A WHOLE.

Independent claim 24 recites:

> An electrical power distribution plugstrip of the type for providing power to ***one or more electrical loads in a vertical electrical equipment rack***, the electrical power distribution plugstrip comprising in combination:
>
> A. ***a vertical strip enclosure having a thickness, and a length that is longer than a width of the enclosure***;
>
> B. a power input penetrating said ***vertical strip enclosure***;
>
> C. a plurality of power outputs disposed along an area on a face of said length of the strip enclosure, ***each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads***;
>
> D. a plurality of power control relays disposed in said ***vertical strip enclosure***, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs ***among said plurality of power outputs***; and
>
> E. a ***digital display*** disposed ***on another area*** of ***said vertical strip enclosure*** and adjacent to said plurality of power outputs in information-determining communication with at least one among said power input and ***said plurality of power outputs***, said digital display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and ***said plurality of power outputs***.

The "digital display" limitation is equivalent to the "user display" limitation of independent claim 10.

For reasons similar to those given above in support of independent claim 10, the Office Action did not establish a *prima facie* case due to its incorrect claim construction, its erroneous use of advantages from the specification to provide the motivation to combine, and its omission from the claimed subject matter as a whole of the advantages, the applicants' discovery of the problem to be solved, and the resulting advantages. Thus, independent claim 24 is allowable as a matter of law.

F. DEPENDENT CLAIMS 25, 27, 29, AND 31 ARE ALLOWABLE BECAUSE THEY DEPEND FROM ALLOWABLE CLAIM 24 AND BECAUSE THEY RECITE RESPECTIVE LIMITATIONS THAT MAKE EACH SEPARATELY PATENTABLE.

Claims 25, 27, 29, and 31 depend directly or indirectly from independent claim 24. Because dependent claims include the limitations of the claims from which they depend, Appellants submit that dependent claims 25, 27, 29, and 31 are patentable over Schreiber in view of Liu for at least the reasons set forth above.

Additionally, dependent claims 25, 27, 29, and 31 recite respective method acts that make each separately patentable. The patentability of each of these claims is argued separately below.

1. Dependent Claim 25 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 25.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach "at least one ***intelligent power section*** disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

2. Dependent Claim 27 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Sections Limitation of Claim 27.

For reasons similar to those given above in support of the intelligent power sections limitation of claim 13, the cited combination of references fails to teach "a plurality of ***intelligent power sections*** disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

3. Dependent Claim 29 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 29.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

4. Dependent Claim 31 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 31.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs

for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

G. DEPENDENT CLAIMS 12, 14, 17, 19, 21, AND 23 ARE ALLOWABLE BECAUSE THEY DEPEND FROM ALLOWABLE CLAIM 24.

Claims 12, 14, 17, 19, 21, and 23 depend directly or indirectly from independent claim 10. Because dependent claims include the limitations of the claims from which they depend, Appellants submit that dependent claims 12, 14, 17, 19, 21, and 23 are patentable over Schreiber in view of Liu for at least the reasons set forth above and that Lovrenich fails to cure the deficiencies of Schreiber and Liu.

Additionally, dependent claims 12, 14, 19, 21, and 23 recite respective method acts that make each separately patentable. The patentability of each of these claims is argued separately below.

1. Dependent Claim 12 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the External Power Manager Application Limitation of Claim 12.

The cited combination of references fails to teach or suggest the electrical power distribution plugstrip of claim 12 further comprising "an ***external power manager application*** external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs" (emphasis added).

Reading claim 12 in view of the Specification can allow no other conclusion other than that the external power manager application is an application that is ***external to the***

claimed vertical strip enclosure, communicates with an intelligent power module (IPM) via a network, and ***allows a user to control power to the claimed outputs disposed along a face of the vertical strip enclosure***. For example, FIG. 2 of the present application illustrates an external power manager application or network management system (NMS) 202 that communicates through a network 204 with an IPM or remote power manager 224 within a remote site power controller 208. The power manager application 202 is external with respect to the power controller 208, as is readily apparent in FIG. 2. The "power controller 208 forwards operating power through a sensor 210 and relay-switch 212 to a computer-based appliance 214" (*see,* Specification, page 6, lines 25-28). The Specification also states, at page 7, lines 9-14:

> The power controller 208 can be configured to operate in a number of different modes, and such options are selected and stored in a configuration memory. The NMS 202 may download configurations to power controller 208, and may upload them for editing, archiving, and/or duplication to other power controllers 208 at other remote sites 206.

Thus, the external power manager application 202 communicates with the power controller 208 through the network 204 and provides remote control of power to outlets at the remote site. For example, a power-on rebooting of software in the computer-based appliance 214 can be forced remotely from the external power manager application (see, Specification, page 7, lines 27-29). The IPM or remote power manager 224 (called such because it is remote with respect to the external power manager application 202) in FIG. 2 can execute instructions from the external power manager application 202. For example, "messages can be sent from the NMS 202 that will cause the remote power manager 224 to operate the relay-switch 212" (*see* Specification, page 8, lines 8-10).

Additionally, a browser application 238, such as a web browser, can be implemented (*see* Specification, page 9, lines 5-7).

The Office Action erred in its claim construction of claim 12 because it did not construe the external power manager application to be external to the claimed vertical strip enclosure, communicate with an intelligent power module (IPM) via a network, and allow a user to control power to the claimed outputs disposed along a face of the vertical strip enclosure. Rather, it construed the claimed subject matter to be a mere computer interface. For example, the Office Action noted at page 5 that both Schreiber and Liu fail to teach an external power manager application but asserted that Lovrenich cures this deficiency by teaching "a computer interface that is capable of providing an unlimited number of addressable multiplexed output ports to interface with remote peripheral devices, wherein the remote peripheral devices need not have inherent address circuitry, and wherein the computer interface can be inexpensively manufactured" (*see,* Office Action, page 15, quoting Lovrenich, col. 3, lines 8-14). "The extent of the functions which can be performed depend on the capabilities of the device" (*see,* Office Action, page 15, quoting Lovrenich, col. 6, lines 50-51).

Nothing in Lovrenich teaches or suggests an application that is either: (i) external to the claimed vertical strip enclosure; (ii) communicates with an intelligent power module (IPM) via a network; or (iii) allows a user to control power to the claimed outputs disposed along a face of the vertical strip enclosure. Lovrenich merely describes a "cascadable computer interface apparatus for providing a data communication path between an input port and a selected one of a plurality of output ports" (see, Lovrenich, col. 3, lines 29-32). Lovrenich makes no mention of, nor do any of its disclosed

embodiments describe, any apparatus for controlling power, nor does it describe the use of a network much less to facilitate communication with such a power controlling apparatus. As such, Lovrenich fails to teach or suggest an external power manager application as required by claim 12. Thus, the purported combination, even if proper, does not yield the claimed subject matter and, therefore, cannot render the claimed subject matter obvious as a matter of law.

As discussed above with respect to claim 10, the record must provide a proper motivation or suggestion to combine. The Office Action cited no such motivation or suggestion to combine Schreiber, Liu, and Lovrenich, and for yet another reason the Office Action did not make out a *prima facie* case of obviousness. The applicants submit that the Office Action did not cite any such motivation or suggestion to combine the three references because there is none.

In sum, claim 12 is allowable as a matter of law because of the improper claim construction and lack of *prima facie* case of obviousness. Even assuming proper claim construction and a *prima facie* case, Applicants have still rebutted the conclusion of obviousness based on the asserted combination's inability to yield the claimed subject matter, the numerous advantages that are part of the subject matter as a whole not taught or suggested by the prior art, and the applicants' discovery of the problem to be solved as part of the subject matter as a whole.

2. Dependent Claim 14 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the External Power Manager Application Limitation of Claim 14.

For reasons similar to those given above in support of the external power manager application limitation of claim 12, the cited combination of references fails to teach "an

external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

3. Dependent Claim 19 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Intelligent Power Section Limitation of Claim 19.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

4. Dependent Claim 21 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Electrical Power Distribution Plugstrip of Claim 21

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

5. Dependent Claim 23 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Electrical Power Distribution Plugstrip of Claim 23.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

H. DEPENDENT CLAIMS 26, 28, 30, AND 32 ARE ALLOWABLE BECAUSE THEY DEPEND FROM ALLOWABLE CLAIM 24 AND BECAUSE THEY RECITE RESPECTIVE LIMITATIONS THAT MAKE EACH SEPARATELY PATENTABLE.

Claims 26, 28, 30, and 32 depend directly or indirectly from independent claim 24. Because dependent claims include the limitations of the claims from which they depend, Appellants submit that dependent claims 26, 28, 30, and 32 are patentable over Schreiber in view of Liu for at least the reasons set forth above and that Lovrenich fails to cure the deficiencies of Schreiber and Liu.

Additionally, dependent claims 26, 28, 30, and 32 recite additional advantageous subject matter that make each separately patentable. The patentability of each of these claims is argued separately below.

1. Dependent Claim 26 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the External Power Manager Application Limitation of Claim 26.

For reasons similar to those given above in support of the external power manager application limitation of claim 12, the cited combination of references fails to teach "an

external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

2. Dependent Claim 28 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Electrical Power Distribution Plugstrip of Claim 28.

For reasons similar to those given above in support of the external power manager application limitation of claim 12, the cited combination of references fails to teach "an ***external power manager application*** external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

3. Dependent Claim 30 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Electrical Power Distribution Plugstrip of Claim 30.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

4. Dependent Claim 32 Is Also Allowable Because The Cited Combination of References Fails to Teach or Suggest the Electrical Power Distribution Plugstrip of Claim 32.

For reasons similar to those given above in support of the intelligent power section limitation of claim 11, the cited combination of references fails to teach an "***intelligent power section*** compris[ing] an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay" (emphasis added), or to suggest any such advantageous structure in the claimed combination.

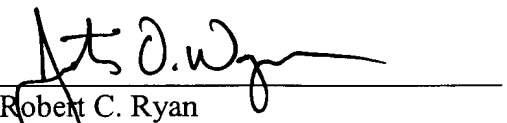
I. CONCLUSION.

Appellants respectfully submit that all of the appealed claims in the present application are allowable and respectfully request that the Board of Patent Appeals and Interferences reverse the rejections of claims 10-32.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 595-5300
Facsimile: (503) 595-5301

By 
Robert C. Ryan
Reg. No. 29,342
Justin D. Wagner
Reg. No. 54,519

VIII. CLAIMS APPENDIX

1-9. Cancelled.

10. An electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination:

A. a vertical strip enclosure having a thickness, and a length that is longer than a width of the enclosure;

B. a power input penetrating said vertical strip enclosure;

C. a plurality of power outputs disposed along a face of said length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads;

D. a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs; and

E. a user display disposed on said vertical strip enclosure and adjacent to the plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, said user display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

11. The electrical power plugstrip of claim 10 further comprising at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays.

12. The electrical power plugstrip of claim 11 further comprising an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

13. The electrical power plugstrip of claim 10 further comprising a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs.

14. The electrical power plugstrip of claim 13 further comprising an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

15. The electrical power plugstrip of claim 10 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

16. The electrical power plugstrip of claim 13 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

17. The electrical power plugstrip of claim 14 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

18. The electrical power plugstrip of claim 11 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

19. The electrical power plugstrip of claim 12 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

20. The electrical power plugstrip of claim 13 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

21. The electrical power plugstrip of claim 14 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

22. The electrical power plugstrip of claim 16 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

23. The electrical power plugstrip of claim 17 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

24. An electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination:

A. a vertical strip enclosure having a thickness, and a length that is longer than a width of the enclosure;

B. a power input penetrating said vertical strip enclosure;

C. a plurality of power outputs disposed along an area on a face of said length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads;

D. a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs; and

E. a digital display disposed on another area of said vertical strip enclosure and adjacent to said plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, said digital display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

25. The electrical power plugstrip of claim 24 further comprising at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays.

26. The electrical power plugstrip of claim 25 further comprising an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

27. The electrical power plugstrip of claim 24 further comprising a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs.

28. The electrical power plugstrip of claim 27 further comprising an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

29. The electrical power plugstrip of claim 25 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

30. The electrical power plugstrip of claim 26 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

31. The electrical power plugstrip of claim 27 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

32. The electrical power plugstrip of claim 28 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

IX. EVIDENCE APPENDIX

Copies of the application as filed and formal drawings are attached hereto. Also attached are copies of entered Amendments in this case, filed February 28, 2005 and May 6, 2005. Copies of the references relied upon by the Examiner as to grounds of rejection to be reviewed on appeal are also attached, and include the following:

U.S. Patent No. 5,424,903 ("Schreiber");

U.S. Patent No. 6,476,729 ("Liu"); and

U.S. Patent No. 5,619,722 ("Lovrenich").

Schreiber, Liu, and Lovrenich were entered into the record by the Examiner in the Notice of References Cited sent with the Office Action mailed on October 22, 2004.

Each item is separately tabbed and paginated.

X. RELATED PROCEEDINGS APPENDIX

There are no appeals, interferences, or judicial proceedings known to Appellants, Appellants' legal representative, or the assignee that may be related to, directly affect or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

The petitioners, Carrel W. EWING, a citizen of the United States and a resident of Incline Village, Nevada, and whose post office address is 285 Deer Court, Incline Village, NV 89451; Brian P. AUCLAIR, a citizen of the United States and a resident of Reno, Nevada, and whose post office address is 4540 Great Falls Loop, Reno, NV 89511; Mark J. BIGLER, a citizen of the United States and a resident of Eugene, Oregon, and whose post office address is 3422 Willamette Street, Eugene, OR 97405; Andrew J. CLEVELAND, a citizen of the United States and a resident of Reno, Nevada, and whose post office address is 5419 Greenview Court, Reno, NV 89502; James P. MASKALY, a citizen of the United States and a resident of Sparks, Nevada, and whose post office address is 1568 Topeka Circle, Sparks, NV 89434; and, Dennis W. MCGLUMPHY, a citizen of the United States and a resident of Sun Valley, Nevada, and whose post office address is 764 Snowdrop Ct. Sun Valley, NV 89433, pray that letters patent may be granted to them for a

VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP

set forth in the specification.

VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP

CO-PENDING APPLICATIONS

This Application is a continuation-in-part of United States Patent Application serial number 09/732,557, filed 12/08/2000, titled NETWORK-CONNECTED POWER MANAGER FOR REBOOTING REMOTE COMPUTER-BASED APPLIANCES, that is a continuation-in-part of United States Patent Application serial number 09/375,471, filed 08/16/1999, titled REMOTE POWER CONTROL SYSTEM THAT VERIFIES WHICH DEVICES IS SHUT-DOWN BEFORE SUCH ACTION IS COMMITTED TO, which in turn is a continuation-in-part of United States Patent Application serial number 08/685,436, that was filed on 7/23/1996 and is titled, SYSTEM FOR READING THE STATUS AND CONTROLLING THE POWER SUPPLIES OF APPLIANCES CONNECTED TO COMPUTER NETWORKS, and now United States Patent 5,949,974, issued 09/07/1999.

BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates generally to remote power management systems, and more particularly to electrical power distribution devices and methods for conserving the primary rack-mount spaces in a standard RETMA rack.

Description of the Prior Art

Network server "farms" and other network router equipment have settled on the use of equipment bays in 19" standard RETMA racks. Many of these server and router farms are located at telephone company (TelCo) central equipment offices because they need to tie into very high bandwidth telephone line trunks and backbones. So each TelCo typically rents space on their

premises to the network providers, and such space is tight and very expensive.

The typical network router, server, or other appliance comes in a rack-mount chassis with a standard width and depth. Such chassis are vertically sized in whole multiples of vertical units (U). Each rented space in the TelCo premises has only so much vertical space, and so the best solution is to make best use of the vertical space by filling it with the network appliances and other mission-critical equipment.

Two kinds of operating power are supplied to such network appliances, alternating current (AC) from an uninterruptable power supply (UPS) or direct from a utility, the second kind is direct current (DC) from TelCo central office battery sets. Prior art devices have been marketed that control such AC or DC power to these network appliances. For example, Server Technology, Inc., (Reno, NV) provides operating-power control equipment that is specialized for use in such TelCo premises RETMA racks. Some of these power-control devices can cycle the operating power on and off to individual network appliances.

Such cycling of operating power will force a power-on reset of the network appliance, and is sometimes needed when an appliance hangs or bombs. Since the network appliance is usually located remote from the network administration center, Server Technology has been quite successful in marketing power managers that can remotely report and control network-appliance operating power over the Internet and other computer data networks.

Conventional power management equipment has either been mounted in the tops or bottoms of the server farm RETMA racks, and thus has consumed vertical mounting space needed by the network appliances themselves. So what is needed now is an alternate way of supplying AC or DC operating power to such network appliances without having to consume much or any RETMA rack space.

SUMMARY OF THE PRESENT INVENTION

Briefly, a vertical-mount electrical power distribution plugstrip embodiment of the present invention comprises a long, thin plugstrip body with several power outlet plugs distributed along the length of one face. A power input cord is provided at one end, and this supplies operating power to each of the power outlet plugs through individual relay control.

An advantage of the present invention is that an electrical power distribution plugstrip is provided that frees up vertical rackmount space for other equipment.

Another advantage of the present invention is that an electrical power distribution plugstrip is provided for controlling the operating power supplied to network appliances.

A further advantage of the present invention is that an electrical power distribution plugstrip is provided that allows a network console operator to control the electrical power status of a router or other network device.

A still further advantage of the present invention is that an electrical power distribution plugstrip is provided for reducing the need for enterprise network operators to dispatch third party maintenance vendors to remote equipment rooms and POP locations simply to power-cycle failed network appliances.

These and many other objects and advantages of the present invention will no doubt become obvious to those of ordinary skill in the art after having read the following detailed description of the preferred embodiments which are illustrated in the various drawing figures.

IN THE DRAWINGS

Fig. 1 is a functional block diagram of an electrical power distribution plugstrip embodiment of the present invention;

Fig. 2 is a functional block diagram of a power manager system embodiment of the present invention that incorporates the electrical power distribution plugstrip of Fig. 1 in a TCP/IP network environment;

Fig. 3 is a functional block diagram of four intelligent power modules in a serial-communication daisy-chain all in a power manager system embodiment of the present invention that is one embodiment of the electrical power distribution plugstrip of Fig. 1;

Fig. 4A is a functional block diagram of an intelligent power module embodiment of the present invention that is one embodiment of the electrical power distribution plugstrip of Fig. 1;

Fig. 4B is a functional block diagram of another intelligent power module embodiment of the present invention in which a single power manager is able to simultaneously control four 4-relay boards;

Fig. 5 is a functional block diagram of a single intelligent power module that controls several loads with dry-contact relays and can issue an alarm to alert a user when too much current is being demanded by one load, or all of the loads together;

Fig. 6 is a schematic diagram of an addition to a four-port power module that can be used to monitor and report the load current being delivered through each power outlet socket;

Fig. 7 is a functional block diagram of a power distribution unit embodiment of the present invention that allows a variety of personality modules to be installed for various kinds of control input/output communication; and

Fig. 8 is a functional block diagram of a 4-port intelligent power module embodiment of the present invention like those shown in Fig. 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Fig. 1 represents an electrical power distribution plugstrip embodiment of the present invention, and is referred to herein by the general reference numeral 100. The electrical power distribution plugstrip 100 includes a long, thin housing 102 with one face having a user display 104 and a set of RJ-11 control jacks 106. A power input cord 108 is provided at one end and has an appropriate power plug 110. For example, the power plug 110 is rated for 125VAC at 30A. A plurality of power outlet sockets 111-126 are provided along a single face of the housing 102. The user display 104 preferably provides a digital readout of the total input current flowing in on power input cord 108.

The total input current display 104 can be used to advantage by a technician when installing or troubleshooting a RETMA equipment rack by watching how much current change is observed when each network appliance is plugged in and turned on. Unusually high or low currents can indicate particular kinds of faults to experienced technicians.

In alternative embodiments of the present invention, each power outlet socket 111-126 is provided with a current-sensing device that can measure the individual load current. Such measurement can then be reported locally on the user display 104, or serially communicated out to a remote location. Which power outlet socket 111-126 to measure can be user selected by a simple pushbutton associated with each. Other more complex selection mechanisms can also be employed.

A first group of power outlet sockets 111-114 are mounted on a first intelligent power module (IPM) 128. A second group

of power outlet sockets 115-118 are mounted on a second IPM 130. A third group of power outlet sockets 119-122 are mounted on a third IPM 132. And a fourth group of power outlet sockets 123-126 are mounted on a fourth IPM 134. The user display 104 and RJ-11 control jacks 106 are mounted on a power distribution and user display printed circuit board (PCB) 144. A power transformer 146 is used to step-down electrical power to the logic power supply levels needed by the IPM's 128-134, and PCB 144.

The manufacturing and marketing of IPM's 128-134 can be greatly enhanced by making the hardware and software implementation of each IPM the same as the others. When a system that includes these IPM's is operating, it preferably sorts out for itself how many IPM's are connected in a group and how to organize their mutual handling of control and status data in and out.

Fig. 2 represents a power manager system embodiment of the present invention, and is referred to herein by the general reference numeral 200. The electrical power distribution plugstrip 100 (Fig. 1) is incorporated here, but is shown controlling only one relay and the operating power to one network appliance. Preferred embodiments of the present invention control many such relays and their corresponding network appliances.

A network management system (NMS) 202 is connected by a network 204 to a remote site 206. A power controller 208 forwards operating power through a sensor 210 and relay-switch 212 to a computer-based appliance 214. As many of the functional parts of power controller 208 as possible are packaged in preferred embodiments of the present invention in a package like that of the electrical power distribution plugstrip 100 (Fig. 1). Preliminary implementations have packaged the network interface components in another chassis, e.g., one that rack-mounts in a 19" RETMA equipment rack at remote site 206.

The operating power being controlled by relay 212 can be the traditional 110 VAC or 220 VAC power familiar to consumers, or direct current (DC) battery power familiar to telephone central-office "plant" employees. A network interface controller (NIC) 216 may be used to connect the computer-based appliance 214 to the network 204. Such would be especially true if the computer-based appliance 214 were a server, router, bridge, etc.

The power controller 208 can be configured to operate in a number of different modes, and such options are selected and stored in a configuration memory. The NMS 202 may download configurations to power controller 208, and may upload them for editing, archiving, and/or duplication to other power controllers 208 at other remote sites 206. Embodiments of the present invention are directed towards systems and methods that do such uploading, downloading, editing, archiving, and duplication of power manager configuration files.

The power manager system 200 maintains the operating health of the computer-based appliance 214. Such computer-based appliance 214 is prone to freezing or crashing where it is effectively dead and unresponsive. It is also some mission-critical assignment that suffers during such down time. It is therefore the role and purpose of the power manager 200 to monitor the power and environmental operating conditions in which the computer-based appliance 214 operates, and to afford management personnel the ability to turn the computer-based appliance 214 on and off. Such allows a power-on rebooting of software in the computer-based appliance 214 to be forced remotely from the NMS 202. The operating conditions and environment are preferably reported to the NMS 202 on request and when alarms occur.

The power controller 208 further includes a network interface controller (NIC) 218, and this may be connected to a security device 220. If the network 204 is the Internet, or otherwise insecure, it is important to provide protection of a network agent 222 from accidental and/or malicious attacks that

could disrupt the operation or control of the computer-based appliance 214. At a minimum, the security device 220 can be a user password mechanism. Better than that, it could include a discrete network firewall and data encryption.

The network agent 222 interfaces to a remote power manager 224, and it converts software commands communicated in the form of TCP/IP datapackets 226 into signals the remote power manager can use. For example, messages can be sent from the NMS 202 that will cause the remote power manager 224 to operate the relay-switch 212. In reverse, voltage, current, and temperature readings collected by the sensor 210 are collected by the remote power manager 224 and encoded by the network agent 222 into appropriate datapackets 226. Locally, a keyboard 228 can be used to select a variety of readouts on a display 230, and also to control the relay-switch 212.

The display 230 and keyboard 228 can be connected as a terminal through a serial connection to the power manager 224. Such serial connection can have a set of intervening modems that allow the terminal to be remotely located. The display 230 and keyboard 228 can also be virtual, in the sense that they are both emulated by a Telnet connection over the network 204.

The NMS 202 typically comprises a network interface controller (NIC) 232 connected to a computer platform and its operating system 234. Such operating system can include Microsoft WINDOWS-NT, or any other similar commercial product. Such preferably supports or includes a Telnet application 236, a network browser 238, and/or an SNMP application 240 with an appropriate MIB 242. A terminal emulation program or user terminal 244 is provided so a user can manage the system 200 from a single console.

If the computer-based appliance 214 is a conventional piece of network equipment, e.g., as supplied by Cisco Systems (San Jose, CA), there will usually be a great deal of pre-existing SNMP management software already installed, e.g., in NMS 202 and especially in the form of SNMP 240. In such case

it is usually preferable to communicate with the network agent 222 using SNMP protocols and procedures. Alternatively, the Telnet application 236 can be used to control the remote site 206.

An ordinary browser application 238 can be implemented with MSN Explorer, Microsoft Internet Explorer, or Netscape NAVIGATOR or COMMUNICATOR. The network agent 222 preferably includes the ability to send http-messages to the NMS 202 in datapackets 226. In essence, the network agent 222 would include an embedded website that exists at the IP-address of the remote site 206. An exemplary embodiment of a similar technology is represented by the MASTERSWITCH-PLUS marketed by American Power Conversion (West Kingston, RI).

Many commercial network devices provide a contact or logic-level input port that can be usurped for the "tickle" signal. Cisco Systems routers, for example, provide an input that can be supported in software to issue the necessary message and identifier to the system administrator. A device interrupt has been described here because it demands immediate system attention, but a polled input port could also be used.

Network information is generally exchanged with protocol data unit (PDU) messages, which are objects that contain variables and have both titles and values. SNMP uses five types of PDUs to monitor a network. Two deal with reading terminal data, two deal with setting terminal data, and one, the trap, is used for monitoring network events such as terminal start-ups or shut-downs. When a user wants to see if a terminal is attached to the network, for example, SNMP is used to send out a read PDU to that terminal. If the terminal is attached, a user receives back a PDU with a value "yes, the terminal is attached". If the terminal was shut off, a user would receive a packet informing them of the shutdown with a trap PDU.

In alternative embodiments of the present invention, it may be advantageous to include the power manager and intelligent power module functions internally as intrinsic

components of an uninterruptable power supply (UPS). In applications where it is too late to incorporate such functionally, external plug-in assemblies are preferred such that off-the-shelf UPS systems can be used.

Once a user has installed and configured the power controller 208, a serial communications connection is established. For example, with a terminal or terminal emulation program. Commercial embodiments of the present invention that have been constructed use a variety of communications access methods.

For modem access, the communication software is launched that supports ANSI or VT100 terminal emulation to dial the phone number of the external modem attached to the power manager. When the modems connect, a user should see a "CONNECT" message. A user then presses the enter key to send a carriage return.

For direct RS-232C access, a user preferably starts any serial communication software that supports ANSI or VT100 terminal emulation. The program configures a serial port to one of the supported data rates (38400, 29200, 9600, 4800, 2400, 2200, and 300 BPS), along with no parity, eight data bits, and one stop bit, and must assert its Device Ready signal (DTR or DSR). A user then presses the enter key to send a carriage return.

For Ethernet network connections, the user typically connects to a power controller 208 by using a TELNET program or TCP/IP interface. The power manager will automatically detect the data rate of the carriage return and send a username login prompt back to a user, starting a session. After the carriage return, a user will receive a banner that consists of the word "power manager" followed by the current power manager version string and a blank line and then a "Username:" prompt.

A user logged in with the administrative username can control power and make configuration changes. A user logged in with a general username can control power. Also, while a user logged in with the administrative username can control power to

all intelligent power modules, a user logged in with a general username may be restricted to controlling power to a specific intelligent power module or set of intelligent power modules, as configured by the administrator.

A parent case, United States patent application serial number 09/732,557, filed 22/08/2000, titled NETWORK-CONNECTED POWER MANAGER FOR REBOOTING REMOTE COMPUTER-BASED APPLIANCES, includes many details on the connection and command structure used for configuration management of power manager embodiments of the present invention. Such patent application is incorporated herein by reference and the reader will find many useful implementation details there. Such then need not be repeated here.

Referring again to Fig. 2, a user at the user terminal 244 is able to send a command to the power manager 224 to have the power manager configuration file uploaded. The power manager 224 concentrates the configuration data it is currently operating with into a file. The user at user terminal 244 is also able to send a command to the power manager 224 to have it accept a power manager configuration file download. The download file then follows. Once downloaded, the power manager 224 begins operating with that configuration if there were no transfer or format errors detected. These commands to upload and download configuration files are preferably implemented as an extension to an already existing repertoire of commands, and behind some preexisting password protection mechanism. HyperTerminal, and other terminal emulation programs allow users to send and receive files.

In a minimal implementation, the power manager configuration files are not directly editable because they are in a concentrated format. It would, however be possible to implement specialized disassemblers, editors, and assemblers to manipulate these files off-line.

Fig. 3 is a diagram of an expandable power management system 300 that can be implemented in the style of the plugstrip 100 (Fig. 1). In one commercial embodiment of the

present invention, a first power controller board 302 is daisy-chain connected through a serial cable 303 to a second power controller board 304. In turn, the second power controller board 304 is connected through a serial cable 305 to a third power controller board 306. All three power controller boards can communicate with a user terminal 308 connected by a cable 309, but such communication must pass through the top power controller board 302 first.

Alternatively, the user terminal can be replaced by an IP-address interface that will provide a webpresence and interactive webpages. If then connected to the Internet, ordinary browsers can be used to upload and download user configurations.

Each power controller board is preferably identical in its hardware and software construction, and yet the one placed at the top of the serial daisy-chain is able to detect that situation and take on a unique role as gateway. Each power controller board is similar to power controller 208 (Fig. 2). Each power controller board communicates with the others to coordinate actions. Each power controller board independently stores user configuration data for each of its power control ports. A typical implementation will have four relay-operated power control ports. Part of the user configuration can include a user-assigned name for each control port.

A resynchronization program is executed in each microprocessor of each power controller board 302, 304, and 306, that detects where in the order of the daisy-chain that the particular power controller board is preferably located. The appropriate main program control loop is selected from a collection of firmware programs that are copied to every power controller board. In such way, power controller boards may be freely added, replaced, or removed, and the resulting group will resynchronize itself with whatever is present.

The top power controller board 302 uniquely handles interactive user log-in, user-name tables, its private port names, and transfer acknowledgements from the other power

controller boards. All the other power controller boards concern themselves only with their private resources, e.g., port names.

During a user configuration file upload, power controller board 302 begins a complete message for all the power controller boards in the string with the user-table. Such is followed by the first outlets configuration block from power controller board 302, and the other outlet configuration blocks from power controller boards 304 and 306. The power controller board 302 tells each when to chime in. Each block carries a checksum so transmission errors can be detected. Each block begins with a header that identifies the source or destination, then the data, then the checksum.

During a user configuration file download, power controller board 302 receives a command from a user that says a configuration file is next. The user-name table and the serial-name table is received by power controller board 302 along with its private outlets configuration block and checksum. The next section is steered to power controller board 304 and it receives its outlets configuration block and checksum. If good, an acknowledgement is sent to the top power controller board 302. The power controller boards further down the string do the same until the whole download has been received. If all power controller boards returned an acknowledgement, the power controller board 302 acknowledges the whole download. Operation then commences with the configuration. Otherwise a fault is generated and the old configuration is retained.

Figs. 4A and 4B are power control systems that can be implemented in the style of the plugstrip 100 (Fig. 1). Fig. 4A represents a basic power control system 400 that includes four single-point relay boards 401-404 that are able to independently control the operating power flowing to various pieces of network equipment and other appliances. Each relay board 401-404 is separately connected to a power manager 406, e.g., with a three-wire cable 407-410 and RJ-11 type plugs and

jacks. A user can control the system 400 from a user terminal 412.

Fig. 4B represents an expanded power control system 420 that includes four four-point relay boards 421-424. This array is able to independently control the operating power flowing to sixteen pieces of network equipment and other appliances. Each relay board 421-424 is separately connected via a serial RS-232 communications link to a power manager 426, e.g., with a three-wire cable 427-430 and RJ-11 type plugs and jacks. A user can control the system 420 from a user terminal 432. Preferably, the power managers 406 and 426 differ only in their programming, and not in their constituent hardware. Logic level relay boards require only two-wires (control signal and common), but serial relay boards require three wires (data send, data receive, and common). Even logic level boards use three wires, with the third wire being used for the relay board to report power output status (on or off) back to the power controller circuit board.

Each relay board 421-424 includes a PIC-microcontroller, e.g., a Microchip Technology (Chandler, AZ) PIC16F84A device, that controls the serial communication interface with the power manager 426. Serial data is interpreted by the microcontroller and is used to independently operate each of the relay board's several onboard relays. Such serial communication and therefore the microcontroller isn't necessary for the relay boards 401-404 (Fig. 4A).

In a preferred application, the expanded power control system 420 is used instead of daisy-chain connecting power managers to get more control points. For example, power controller boards 304 and 306 (Fig. 3) could be eliminated and still as many as sixteen control points can be accommodated. The configuration in Fig. 3 would otherwise accommodate twelve control points as shown.

Fig. 5 is a single intelligent power module (IPM) 500 for controlling several loads with dry-contact relays. It provides for an alarm to alert when too much current is being demanded

by one or all of the loads together. A serial input/output interface 504 is connected to a microprocessor 506 with a non-volatile program memory 508. A set of dry contacts 510 are generated from serial data. An over-current alarm 512 can issue an external alarm and/or report such condition over the serial communication channel 514 to a user display 516 or over a network interface controller (NIC) 520.

Fig. 6 represents a four-port current monitor 600, which can be used in addition to a four-port power module. The current monitor 600 is used to measure and report the load current being delivered through each power outlet socket. In one embodiment, one of the power mains wires 602 for a power outlet socket is wrapped around a torroid 604 with an air gap. A Hall-effect sensor 606 is disposed in the air gap and can measure the magnetic field generated. Such magnetic field will vary in strength proportional to the current passing through the power mains wires. A commercial device that has delivered good results is manufactured by Allegro Microsystems, Inc. (Worcester, MA), and is marketed as model A3515LUA. See: "www.allegromicro.com". An excellent reference that describes how to use such Hall-effect devices in current-measurement applications is, Allegro Technical Paper STP 98-1, "Non-Intrusive Hall-Effect Current-Sensing Techniques Provide Safe, Reliable Detection and Protection for Power Electronics", by Paul Emerald, circa 2001. Also see, Allegro Data Sheet 27501.10B, "3515 and 3516 Ratiometric, Linear Hall-Effect Sensors for High-Temperature Operation".

Current monitor 600 further comprises an operational amplifier (op-amp) 608 that is combined with a signal diode 610 to precision rectify the AC signal obtained from Hall-effect device 606. The rectified signal is filtered and amplified by an op-amp 612. An output signal 614 is a DC voltage linear with the AC current flowing in the corresponding power mains outlet.

The output of op-amp 612 is input to an analog-to-digital converter (ADC) built into a microcomputer 616. Three other

such current sensing circuits are included, and each respectively produce signals 618, 620, and 622. The microcomputer 616 communicates its four current measurements over a serial input/output (SIO) channel 624. These may be reported to a network operations center via TCP/IP on the Internet, or locally for a user display. Over-current alarms and thresholds are preferably programmed in software in the executing programs included in microcomputer 616. Such alarms, when issued, can also be reported to the network operations center via TCP/IP, or locally.

Essentially, no calibration is needed. The output of the Hall-effect sensor 606 is typically about 5.0 millivolts per Gauss. With two turns on the torroid 604, the air gap will fill with 13.8 Gauss per amp of power-main outlet current. Therefore, for a current of 14.142 amps peak-to-peak, 10.0 amps RMS, the Hall-effect sensor 606 can be expected to output a sinusoidal signal of about 0.9758 volts p-p.

If the ADC conversion is 8-bits with an analog input voltage range of 0-5, each binary bit represents 19.53 millivolts. The input range for a tested ADC was thirty amps, about 8-counts per amp. Keeping with this scaling, the output of the current sensing circuitry at ten amps RMS is 1.56 volts.

In general, embodiments of the present invention provide power-on sequencing of its complement of power-outlet sockets so that power loading is brought on gradually and not all at once. For example, power comes up on the power outlet sockets 2-4 seconds apart. An exaggerated power-up in-rush could otherwise trip alarms and circuit breakers. Embodiments display or otherwise report the total current being delivered to all loads, and some embodiments monitor individual power outlet sockets. Further embodiments of the present invention provide individual remote power control of independent power outlet sockets, e.g., for network operations center reboot of a crashed network server in the field.

The power-on sequencing of the power-outlet sockets preferably allows users to design the embodiments to be loaded

at 80% of full capacity, versus 60% of full capacity for prior art units with no sequencing. In some situations, the number of power drops required in a Data Center can thus be reduced with substantial savings in monthly costs.

Fig. 7 represents a power distribution unit (PDU) embodiment of the present invention, and is referred to herein by the general reference numeral 700. The PDU 700 allows a personality module 702 to be installed for various kinds of control input/output communication. A Philips Semiconductor type P89C644 microcontroller is preferably included in the personality module 702.

The PDU 700 further comprises an I2C peripheral board 704, and a set of four IPM's 706, 708, 710, and 712. Such provide sixteen power outlets altogether. A power supply 714 provides +5-volt logic operating power, and a microcontroller with a serial connection to an inter-IC control (I2C) bus 717. Such I2C bus 717 preferably conforms to industry standards published by Philips Semiconductor (The Netherlands). See, www.semiconductor.philips.com. Philips Semiconductor type microcontrollers are preferably used throughout PDU 700 because of the included interfaces Philips microcontrollers have for the I2C bus.

A SENTRY-slave personality module 716 can be substituted for personality module 702 and typically includes a Server Technology, Inc. (Reno, NV) SENTRY-type interface and functionality through a standard RJ12 jack. See, www.servertech.com. A chained-slave personality module 718 can be substituted for personality module 702 and provides a daisy-chain I2C interface and functionality through a standard RJ12 jack. A terminal-server personality module 720 can be substituted for personality module 702 and provides a display terminal interface, e.g., via I2C through a standard RJ12 jack, or RS-232 serial on a DIN connector. An http personality module 722 can be substituted for personality module 702 and provides a hypertext transfer protocol (http) browser interface, e.g., via 100BASE-T network interface and a CAT-5

connector. The on-board microcontroller provides all these basic personalities through changes in its programming, e.g., stored in EEPROM or Flash memory devices.

All of PDU 700 is preferably fully integrated within power distribution plugstrip 100, in Fig. 1.

Fig. 8 represents a 4-port intelligent power module (IPM) embodiment of the present invention, and is referred to herein by the general reference numeral 800. IPM 800 is like the four IPM's 706, 708, 710, and 712, shown in Fig. 7. The IPM 800 includes a set of four power control channels 801-804, and a microcontroller 806. The Philips 87LPC762 microcontroller has provided good results in this application. Each power control channel 801-804 includes an input control opto-isolator 808, a single-pole, double throw (SPDT) relay 810, and an output opto-isolator 812. A ground (logic low) on IPM_1 will cause relay 810 to pull in. The normally closed (NC) contacts will open, and the normally open (NO) contacts will close. The AC input hot (AC-IN) will be passed through to the AC output (AC-OUT) according to a jumper selection for NO or NC operation. If the power is on at AC-OUT, the output opto-isolator 812 acts as on on-sense (ONSN) detector to provide an open-collector logic signal for a microcontroller status input. The microcontroller 806 sends and receives serial data over the I2C bus, and provides the IPM_1, IPM_2, IPM_3, and IPM_4, control signals for all four power control channels. The microcontroller 806 can also report the on-off status of any of the four power control channels 801-804.

The on-sense circuitry of Fig. 8 is such that more than just the power switch being switched on has to occur, there must be power actually flowing to the relay output to the AC-OUT terminal.

Although the present invention has been described in terms of the present embodiment, it is to be understood that the disclosure is not to be interpreted as limiting. Various alterations and modifications will no doubt become apparent to those skilled in the art after having read the above

disclosure. Accordingly, it is intended that the appended claims be interpreted as covering all alterations and modifications as fall within the true spirit and scope of the invention.

What is claimed is:

IN THE CLAIMS

1. An electrical power distribution plugstrip, comprising:

a strip enclosure for mounting vertically within an equipment rack cabinet and for providing electrical power distribution to a number of electrical loads mounted within such cabinet;

a plurality of power outlet sockets disposed along one longitudinal face of the strip enclosure and each providing for independent supply of operating power to corresponding ones of said electrical loads;

a power input cord for receiving all electrical operating power to be ultimately supplied to every one of said number of electrical loads;

a plurality of power control relays each connected to independently switch electrical current from the power input cord to corresponding ones of the plurality of power outlet sockets; and

a user display disposed on said longitudinal face of the strip enclosure and for providing a digital readout of a total current passing in from the power input cord.

2. The plugstrip of claim 1, further comprising:

an intelligent power module (IPM) in which is disposed at least one of the plurality of power control relays and a corresponding power outlet socket.

3. The plugstrip of claim 2, further comprising:

a power manager connected to the IPM and providing for user control of operating power to selectable ones of said electrical loads.

4. The plugstrip of claim 3, further comprising:

a network interface controller (NIC) connected to the power manager and providing for remote user control of operating power to selectable ones of said electrical loads over a TCP/IP network.

5. The plugstrip of claim 3, further comprising:

a network interface controller (NIC) connected to the power manager and providing for a TCP/IP network report of said total current passing in from the power input cord to a remote user.

6. The plugstrip of claim 1, further comprising:

a plurality of intelligent power modules (IPM's) in which each hosts at least one of the plurality of power control relays and a corresponding power outlet socket.

7. The plugstrip of claim 2, further comprising:

a power manager connected in parallel to the plurality of IPM's and providing for user control of operating power to selectable ones of said electrical loads.

8. The plugstrip of claim 2, further comprising:

a power manager connected in serial to the plurality of IPM's and providing for user control of operating power to selectable ones of said electrical loads by a serial communication channel.

9. The plugstrip of claim 1, further comprising:

a plurality of intelligent power modules (IPM's) in which each hosts at least one of the plurality of power control relays and a corresponding power outlet socket;

wherein each IPM is identical in its hardware and software implementation to each other one.

VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP

ABSTRACT OF THE DISCLOSURE

A vertical-mount electrical power distribution plugstrip comprises a long, thin plugstrip body with several power outlet plugs distributed along the length of one face. A power input cord is provided at one end, and this supplies operating power to each of the power outlet plugs through individual relay control.

Justin D. Wagner
Our Ref. No. 7273-70199-02
Express Mail Label No. EV629077135US
For: VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP
Inventor(s): Ewing et al.
Date of Deposit: October 4, 2005

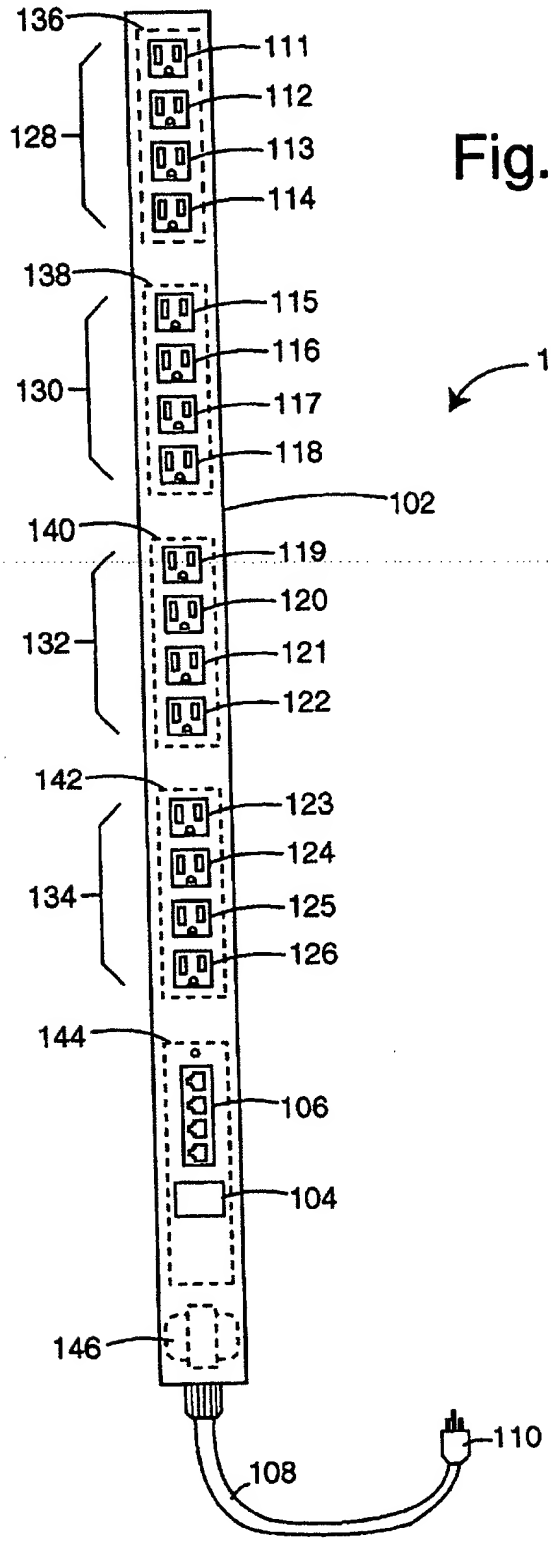


Fig. 1

Justin D. Wagner
Our Ref. No. 7273-70199-02
Express Mail Label No. EV629077135US
For: VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP
Inventor(s): Ewing et al.
Date of Deposit: October 4, 2005

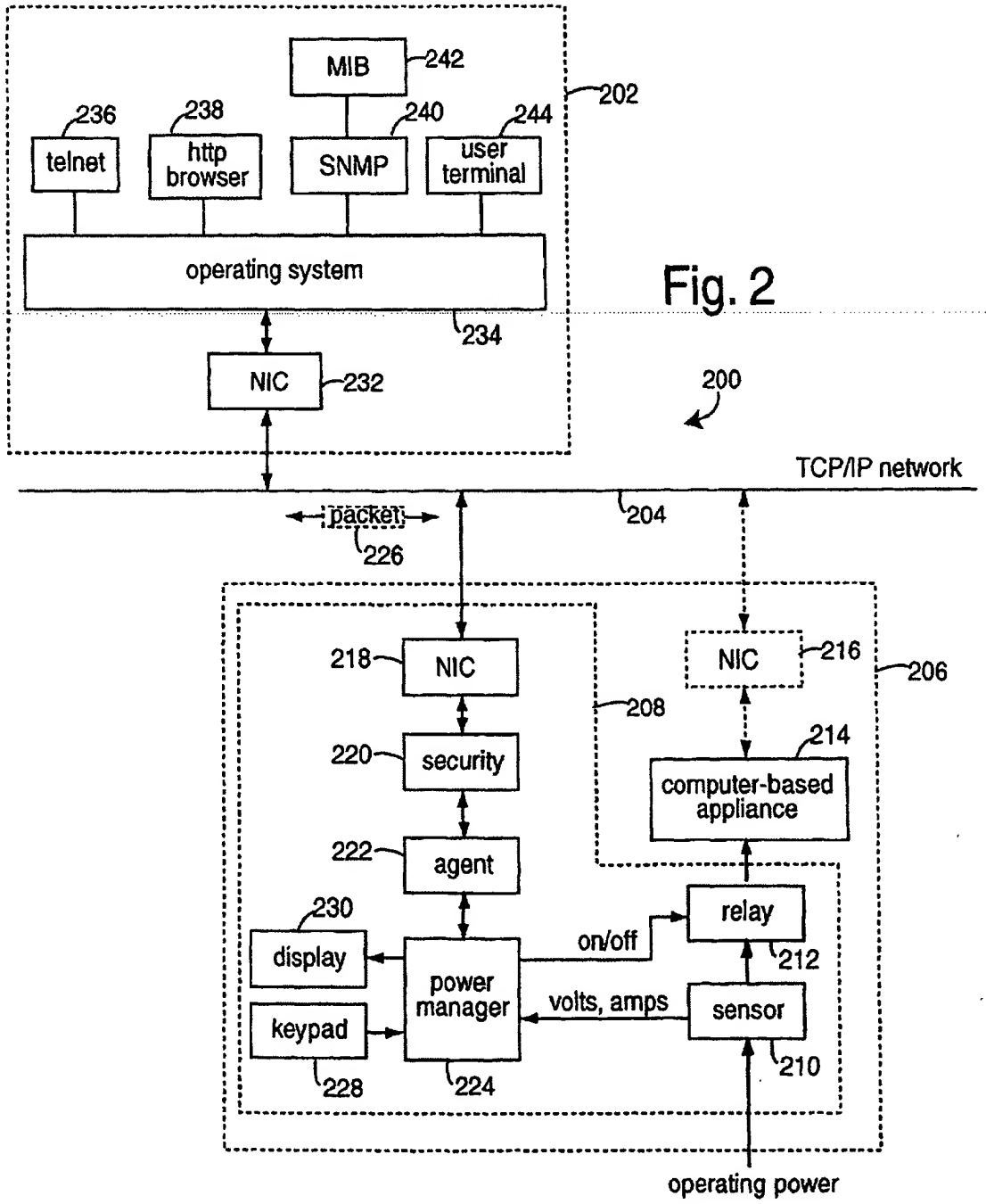


Fig. 2

Justin D. Wagner
Our Ref. No. 7273-70199-02
Express Mail Label No. EV629077135US
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Inventor(s): Ewing et al.
Date of Deposit: October 4, 2005

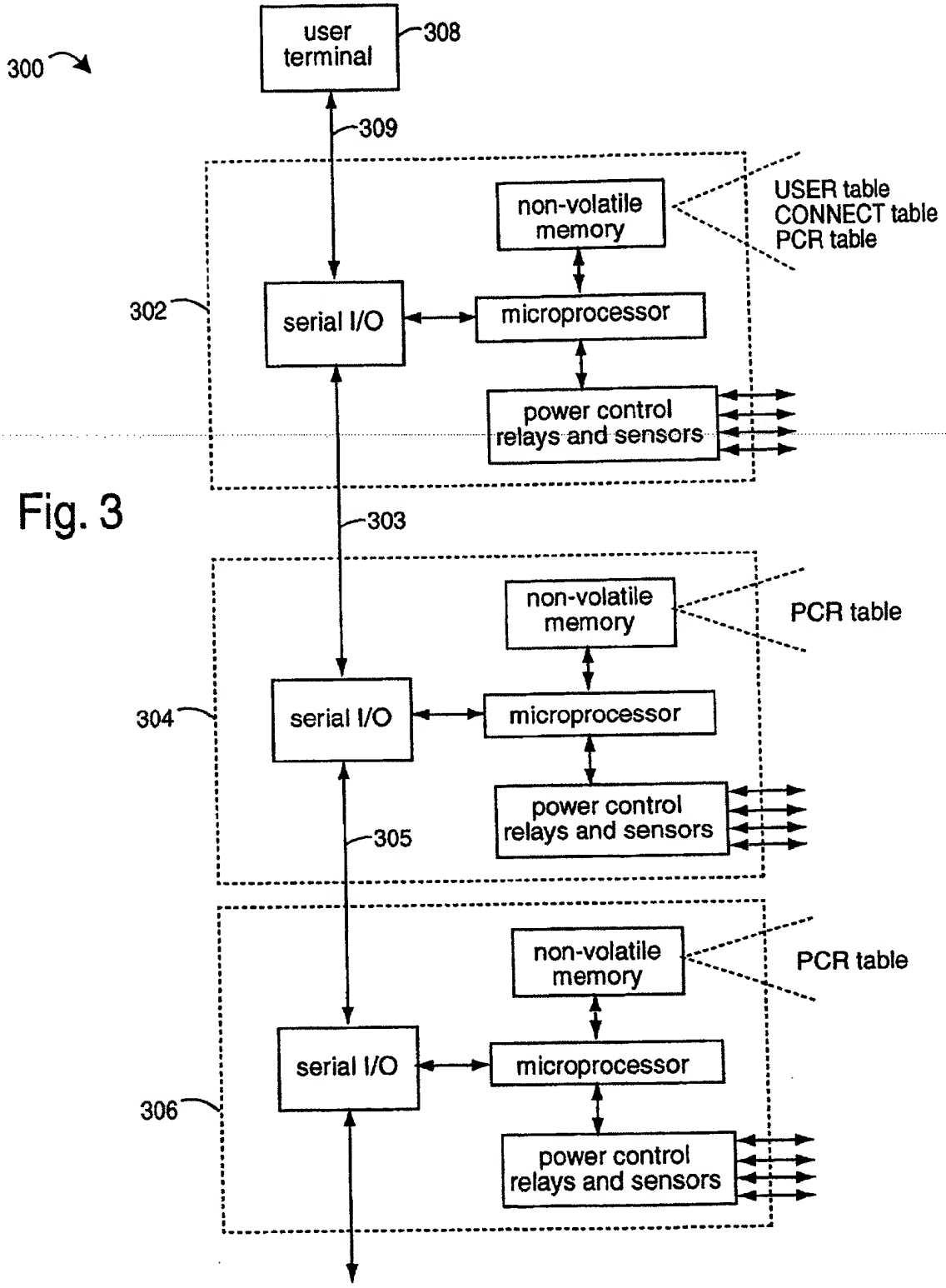


Fig. 3

Justin D. Wagner
Our Ref. No. 7273-70199-02
Express Mail Label No. EV629077135US
For: VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP
Inventor(s): Ewing et al.
Date of Deposit: October 4, 2005

Fig. 4A

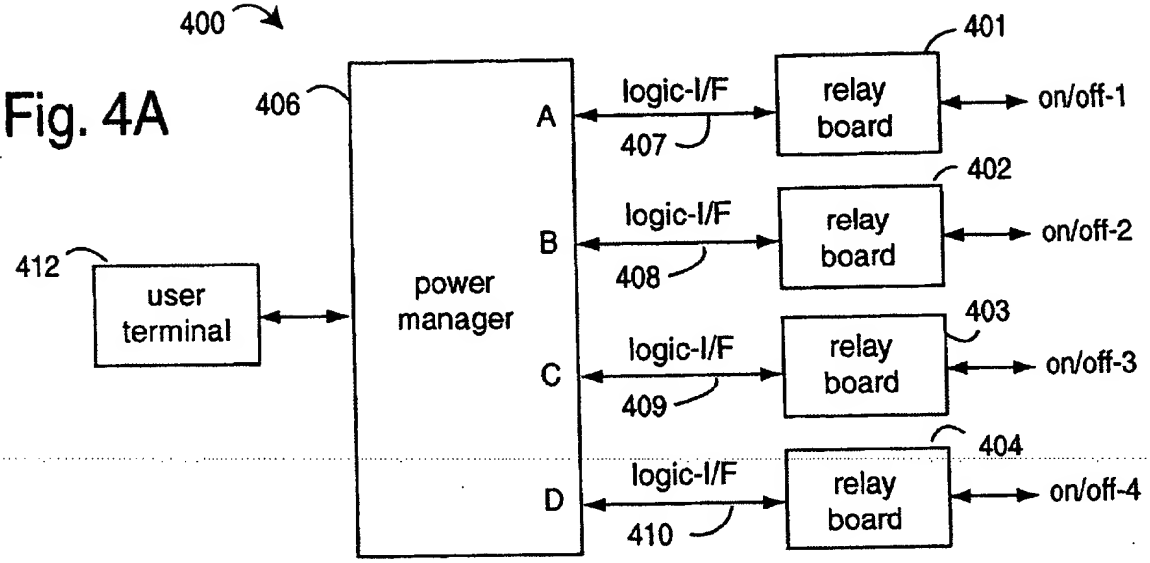
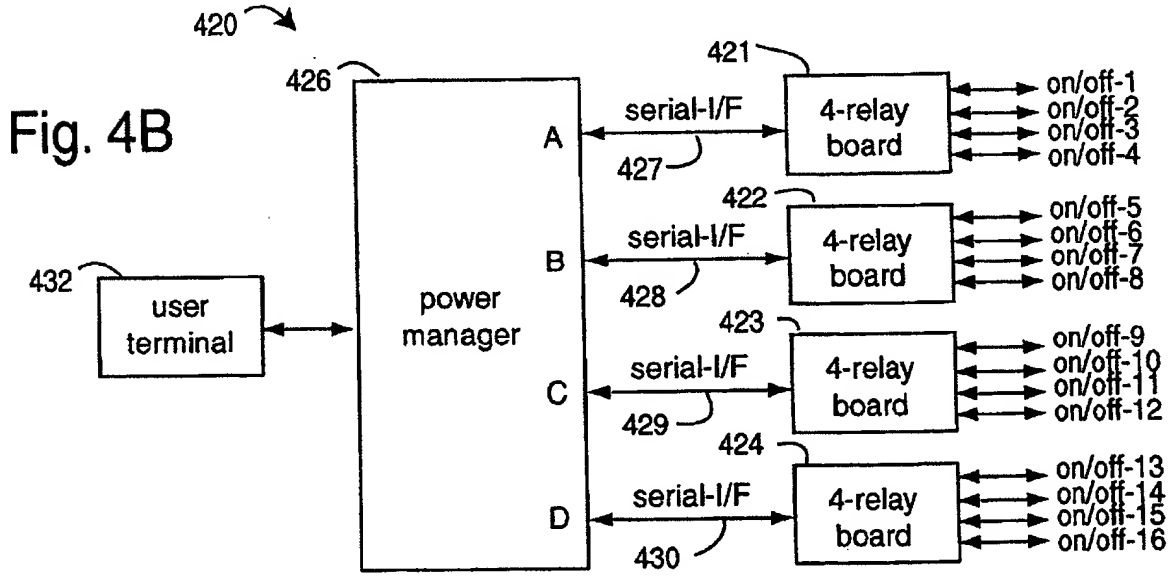


Fig. 4B



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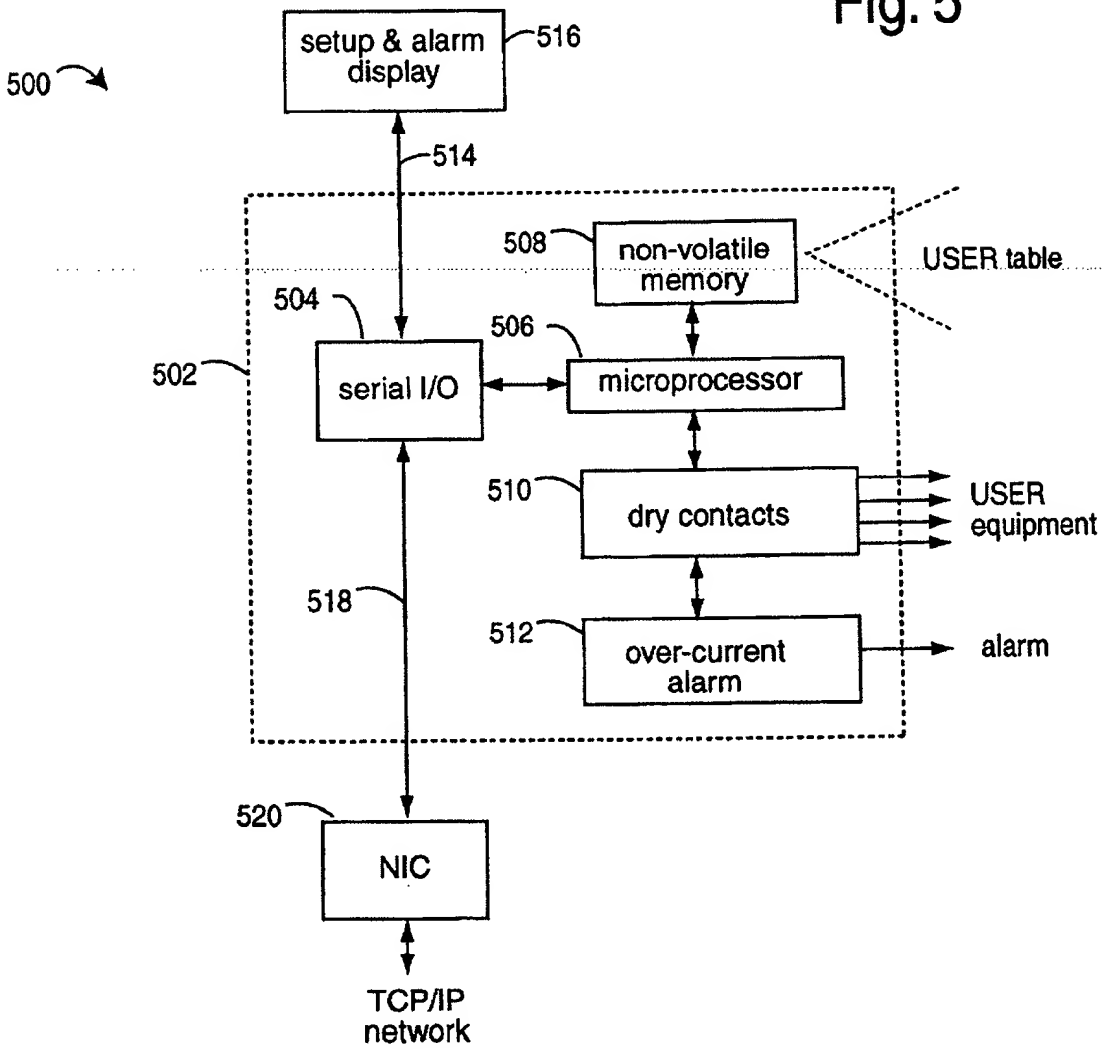
Inventor(s): Ewing et al.
Date of Deposit: October 4, 2005

Fig. 5



Justin D. Wagner
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Inventor(s): Ewing et al
Date of Deposit: October 4, 2005

Fig. 6

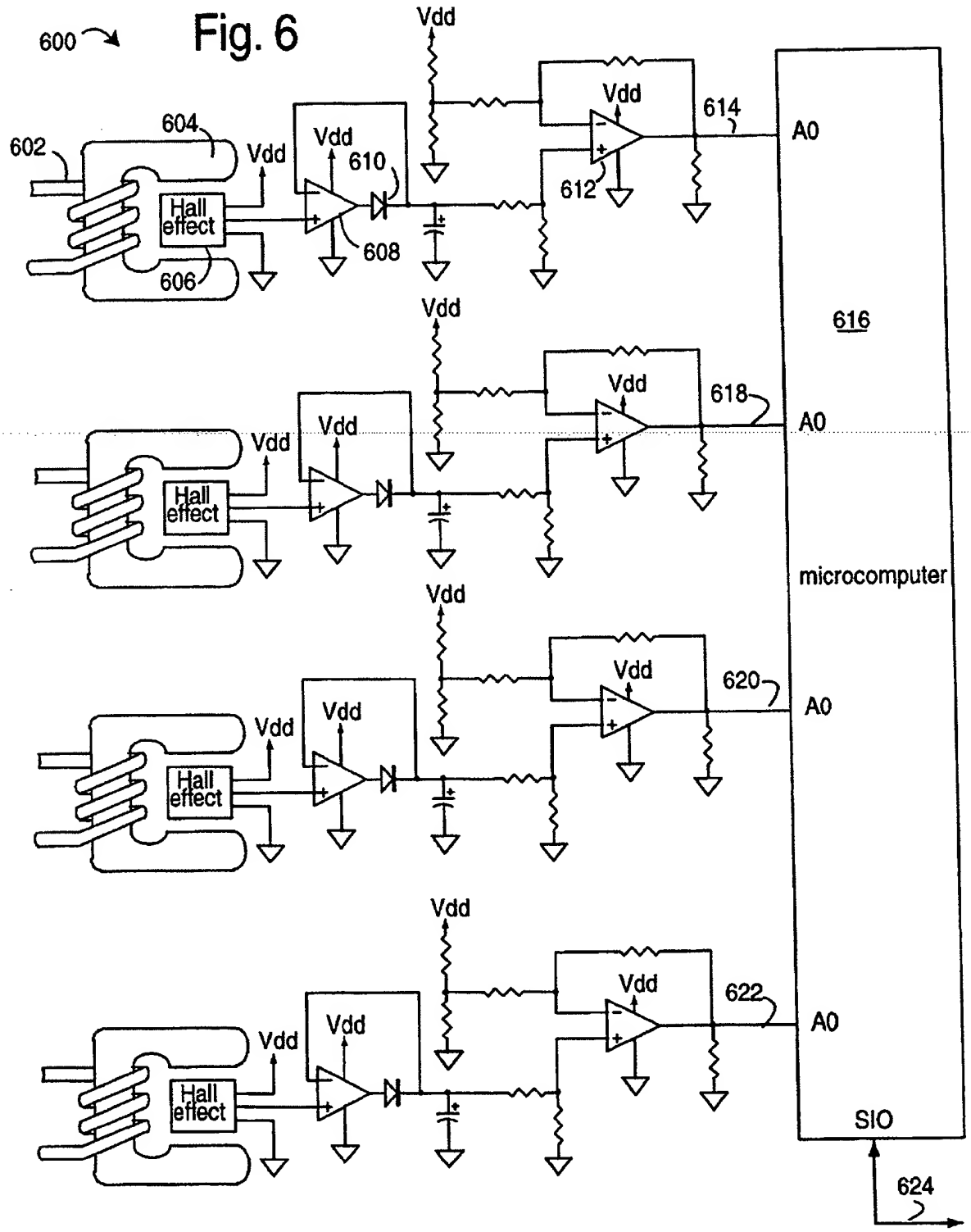
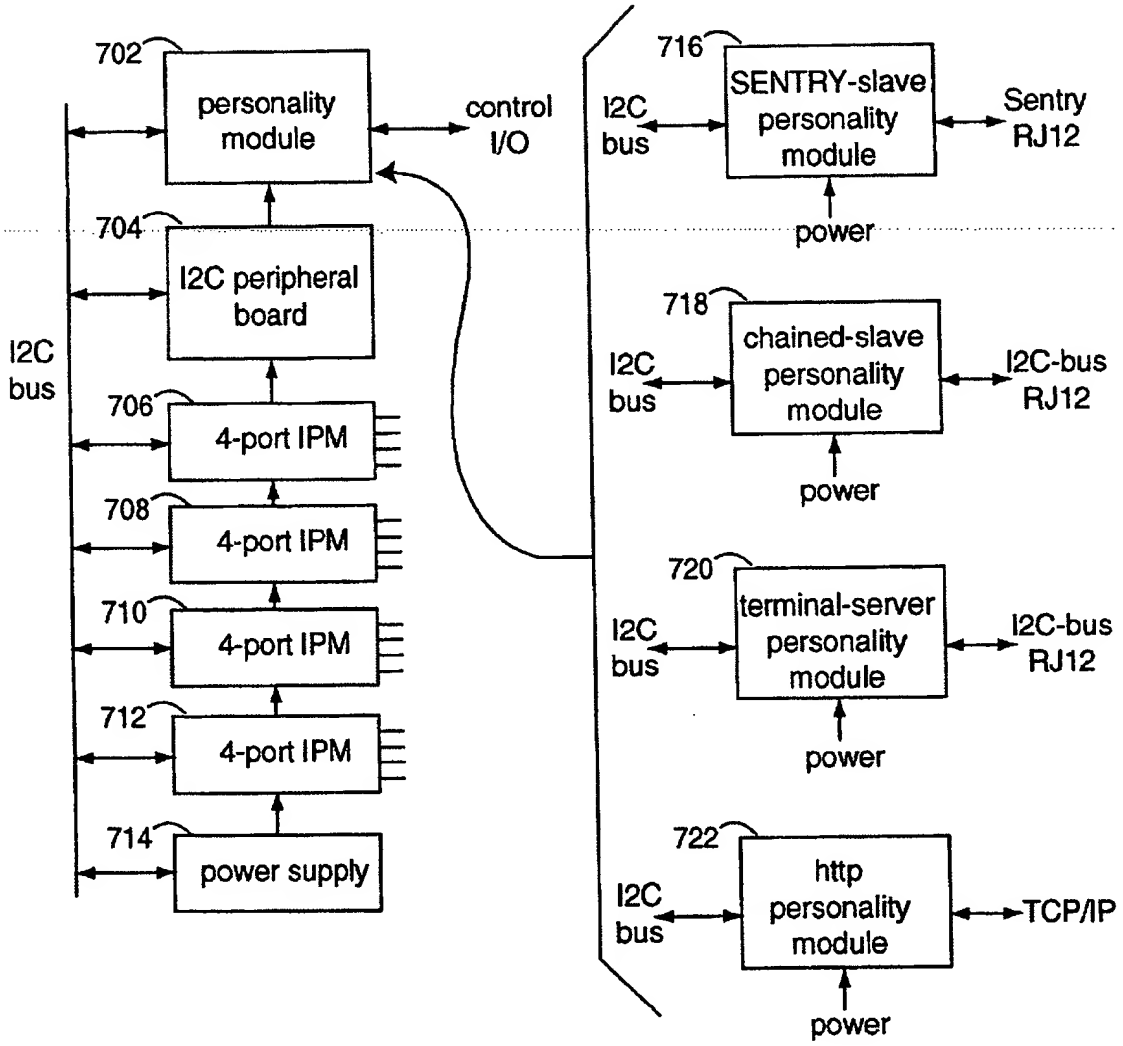


Fig. 7


700
702
personality module
control I/O
704
I2C peripheral board
I2C bus
706
4-port IPM
708
4-port IPM
710
4-port IPM
712
4-port IPM
714
power supply
716
SENTRY-slave personality module
I2C bus
Sentry RJ12
power
718
chained-slave personality module
I2C bus
I2C-bus RJ12
power
720
terminal-server personality module
I2C bus
I2C-bus RJ12
power
722
http personality module
I2C bus
TCP/IP
power

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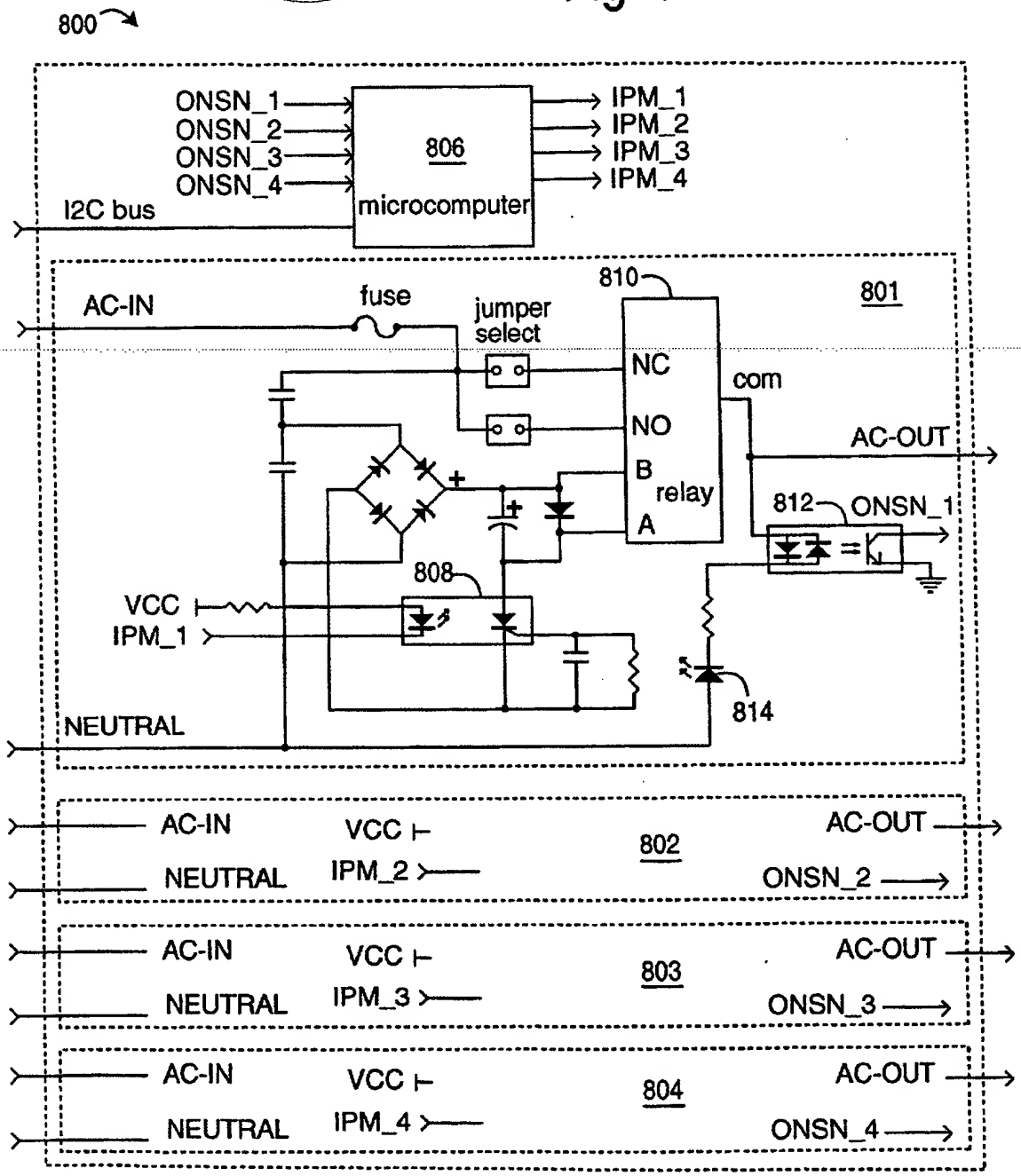
Inventor(s): Ewing et al.
Date of Deposit: October 4, 2005

Fig. 8



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PTO/SB/01 (10-00)
Approved for use through 10/31/2002. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)

☒ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)

Attorney Docket Number	MLF-600-14
First Named Inventor	Carrel W. EWING, et al.
COMPLETE IF KNOWN	
Application Number	
Filing Date	
Group Art Unit	
Examiner Name	

As a below named inventor, I hereby declare that:

My residence, mailing address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP

(Title of the Invention)

the specification of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) ____ as United States Application Number or PCT International Application Number ____ (if applicable).

and was amended on (MM/DD/YYYY) ____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES	NO
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐
			☐	☐	☐

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto:

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)

☐ Additional provisional application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

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DECLARATION — Utility or Design Patent Application

Direct all correspondence to: [X] Customer Number or Bar Code Label 26329 OR [ ] Correspondence address below

Name: Richard B. Main

Address: 24441 Mines Road

Address:

City: Livermore | State: CA | ZIP: 94550

Country: USA | Telephone: (408) 897-3000 | Fax: (408) 897-3102

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

NAME OF SOLE OR FIRST INVENTOR: [ ] A petition has been filed for this unsigned inventor

Given Name (first and middle [if any]): Carrel W. | Family Name or Surname: EWING

Inventor's Signature: Carrel W. Ewing | Date: 8/9/01

Residence: City: Incline Village | State: NV | Country: USA | Citizenship: USA

Mailing Address: 285 Deer Court

Mailing Address:

City: Incline Village | State: NV | ZIP: 89451 | Country: USA

NAME OF SECOND INVENTOR: [ ] A petition has been filed for this unsigned inventor

Given Name (first and middle [if any]): Brian P. | Family Name or Surname: AUCLAIR

Inventor's Signature: Brian P. Auclair | Date: 8/9/01

Residence: City: Reno | State: NV | Country: USA | Citizenship: USA

Mailing Address: 4540 Great Falls Loop

Mailing Address:

City: Reno | State: NV | ZIP: 89511 | Country: USA

[X] Additional inventors are being named on the 2 supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto.

Please type a plus sign (+) inside this box → [+]

PTO/SB/02A (11-00)
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DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 3 of 4

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any])	Family Name or Surname		
Andrew J.	CLEVELAND		
Inventor's Signature Andrew J. Cleveland			Date 8/9/01
Residence: City Reno	State NV	Country USA	Citizenship USA
Mailing Address 5419 Greenview Court			
Mailing Address			
City Reno	State NV	ZIP 89502	Country USA

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any])	Family Name or Surname		
James P.	MASKALY		
Inventor's Signature James P. Maskaly			Date 8/9/01
Residence: City Sparks	State NV	Country USA	Citizenship USA
Mailing Address 1568 Topeka Circle			
Mailing Address			
City Sparks	State NV	ZIP 89434	Country USA

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any])	Family Name or Surname		
Dennis W.	MCGLUMPHY		
Inventor's Signature Dennis W. McGlumphy			Date 8/9/01
Residence: City Sun Valley	State NV	Country USA	Citizenship USA
Mailing Address 764 Snowdrop Court			
Mailing Address			
City Sun Valley	State NV	ZIP 89433	Country USA

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DECLARATION

ADDITIONAL INVENTOR(S)
Supplemental Sheet
Page 4 of 4

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any])	Family Name or Surname		
Mark J.	BIGLER		
Inventor's Signature Mark J Bigler			Date 9-Aug-2001
Residence: City Eugene	State OR	Country USA	Citizenship USA
Mailing Address 3422 Willamette Street			
Mailing Address			
City Eugene	State OR	ZIP 97405	Country USA

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any])	Family Name or Surname		
Inventor's Signature			Date
Residence: City	State	Country	Citizenship
Mailing Address			
Mailing Address			
City	State	ZIP	Country

Name of Additional Joint Inventor, if any:	☐ A petition has been filed for this unsigned inventor		
Given Name (first and middle [if any])	Family Name or Surname		
Inventor's Signature			Date
Residence: City	State	Country	Citizenship
Mailing Address			
Mailing Address			
City	State	ZIP	Country

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Attorney Docket No. 40026XXX2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): EWING et al.

Appl. No.: 09/930,780

Filing Date: August 15, 2001

Confirmation No.: 3325

Art Unit: 2154

Examiner: Patel, A.

For: **VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP**

AMENDMENT

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

This Amendment is in response to the Office Action of October 22, 2004. Initially, Applicants would like to thank the Examiner for granting Applicants' representative the courtesy of conducting an interview in this case on November 22, 2004. The Applicants' summary of the interview is set forth in the Remarks below.

In view of the following arguments and remarks, Applicants respectfully request the Examiner to enter the within amendments under 37 CFR 1.111, reconsider and withdraw the outstanding and rejections, and allow all claims pending in this application.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 9 of this paper.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS

10. (Currently Amended) An electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination:

A. a vertical strip enclosure having a ~~long~~ thickness, and a length ~~and relatively thin~~ that is longer than a width of the enclosure;

B. a power input penetrating said vertical strip enclosure;

C. a plurality of power outputs disposed along a face of said ~~long~~ length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads;

D. a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs; and

E. a user display disposed on said vertical strip enclosure and adjacent to the plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, ~~whereby~~ said user display providing information to a user, the ~~a user may observe~~ information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

11. (Previously Presented) The electrical power plugstrip of claim 10 further comprising at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays.

12. (Previously Presented) The electrical power plugstrip of claim 11 further comprising an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

13. (Previously Presented) The electrical power plugstrip of claim 10 further comprising a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs.

14. (Previously Presented) The electrical power plugstrip of claim 13 further comprising an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

15. (Previously Presented) The electrical power plugstrip of claim 10 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

16. (Previously Presented) The electrical power plugstrip of claim 13 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

17. (Previously Presented) The electrical power plugstrip of claim 14 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

18. (Currently Amended) The electrical power plugstrip of claim 11 wherein said intelligent power section [[10]] comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

19. (Previously Presented) The electrical power plugstrip of claim 12 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

20. (Previously Presented) The electrical power plugstrip of claim 13 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

21. (Previously Presented) The electrical power plugstrip of claim 14 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

22. (Previously Presented) The electrical power plugstrip of claim 16 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

23. (Previously Presented) The electrical power plugstrip of claim 17 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

24. (Currently Amended) An electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination:

A. a vertical strip enclosure having a ~~long~~ thickness, and a length ~~and relatively thin~~ that is longer than a width of the enclosure;

B. a power input penetrating said vertical strip enclosure;

C. a plurality of power outputs disposed along an area on a face of said ~~long~~ length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads; [[and]]

D. a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs; and

E. a digital display disposed on another area of said vertical strip enclosure and adjacent to said plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, said digital display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

25. (Previously Presented) The electrical power plugstrip of claim 24 further comprising at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays.

26. (Previously Presented) The electrical power plugstrip of claim 25 further comprising an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure,

whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

27. (Previously Presented) The electrical power plugstrip of claim 24 further comprising a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs.

28. (Previously Presented) The electrical power plugstrip of claim 27 further comprising an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

29. (Previously Presented) The electrical power plugstrip of claim 25 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

30. (Previously Presented) The electrical power plugstrip of claim 26 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

31. (Previously Presented) The electrical power plugstrip of claim 27 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

32. (Previously Presented) The electrical power plugstrip of claim 28 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

REMARKS

Claims 10-32 were pending in the application. Claims 10, 28, and 24 have been amended. Accordingly, claims 10-32 are presented for reconsideration and further examination in view of the following remarks.

In the outstanding Office Action, the Examiner indicated that Applicants have not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 USC § 120; made a requirement for a new title; rejected claims 10-23, 26, and 28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,424,903 to Schreiber in view of U.S. Patent No. 5,619,722 to Lovrenich; and rejected claims 24, 25, 27, and 29-32 under 35 U.S.C. § 102(b) as being anticipated by Schreiber.

By this Response claims 10, 18, and 24 are amended, and the prior art rejections are traversed. Support for the added features in claims 10 and 24 can be found at least for example in Figure 1, and in the specification page 5, lines 9-20. Claim 18 has been amended to correct a typographical error. Arguments in support thereof are provided.

It is further respectfully submitted that the proposed amendments introduce no new matter within the meaning of 35 U.S.C. § 132.

Interview

In an interview with Examiner Ashokkumar Patel and Primary Examiner Larry Donaghue on November 22, 2004, Applicants' Representative, Teresa M. Arroyo, presented a draft amended claim 24 and proposed new claim 33, and discussed how claims 10-33 distinguished over the cited references.

Priority

The Examiner indicated that Applicants have not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 USC § 120. The Examiner also indicated that the instant application incorporates a user display disposed on a vertical strip enclosure whereby a user may observe information relative to the amount of current flowing through the power input and plurality of power outputs as shown in Fig. 1, element 104. The Examiner was unable to locate this feature in Application Nos. 09/375,471 [sic] (now U.S. Patent No. 6,711,613) and 08/685,436 (now U.S. Patent No. 5,949,974). Therefore, the Examiner considers the subject matter of this application as having a priority date of December 8, 2000.

In response, this application is a Continuation-In-Part (CIP) of Application No. 09/732,557, filed December 8, 2000. This CIP is an application filed during the lifetime of earlier non-provisional Application No. 09/732,557, repeats some substantial portion of the earlier non-provisional application, and *adds matter not disclosed* [emphasis added] in the earlier non-provisional application. (*In re Klein*, 1930 C.D. 2, 393 O.G. 519 (Comm'r Pat. 1930)). The matter not disclosed in Application No. 09/732,557 includes at least the user display. Therefore, Applicants respectfully submit that this Continuation-In-Part application can properly claim the benefit of the prior non-provisional application under 35 U.S.C. § 120.

> "Unless the filing date of the earlier non-provisional application is actually needed, for example, in the case of an interference or to overcome a reference, there is no need for the Office to make a determination as to whether the requirement of 35 U.S.C. § 120, that the earlier non-provisional application discloses the invention of the second application in the manner provided by the first paragraph of 35 U.S.C. § 112, is met and whether a substantial portion of all of the earlier non-provisional application is repeated in the second application in a continuation-in-part situation." MPEP 201.08.

Accordingly, Applicants respectfully request that this CIP application be permitted to claim the benefit of the filing date of the earlier non-provisional application since Applicant has complied with the following formal requirements of 35 U.S.C § 120:

(A) The first application 09/732,577 and this continuation-in-part application 09/892,350 were filed with at least one common inventor, Carrel Ewing and Andrew Cleveland;

(B) This continuation-in-part application 09/930,780 was "filed before the patenting or abandonment of or termination of proceedings on the first application issued or an application similarly entitled to the benefit of the filing date of the first application (09/732,577 is still pending)"; and

(C) This continuation-in-part application "contains or is amended to contain a specific reference to the earlier filed application." (The specific reference is on the first line of the specification of this application.)

Specification

The Examiner indicated that the title of the invention is not descriptive, made a requirement for a new title, and suggested the title: --REMOTELY CONTROLLED RACK MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP--.

In response, Applicants accept Examiner's proposed change to the title. Applicants respectfully request that the requirement be withdrawn.

Rejections under 35 U.S.C. § 103(a)

The Examiner rejected claims 10-23, 26, and 28 as being unpatentable over Shreiber in view of Lovrenich. Reconsideration and withdrawal of the rejection is respectfully requested.

To establish a *prima facie* case of obviousness, the Examiner must establish: (1) that some suggestion or motivation to modify the references exists; (2) a reasonable expectation of success; and (3) that the prior art references teach or suggest all the claim limitations. Amgen, Inc. v. Chugai Pharm. Co., 18 USPQ2d 1016, 1023 (Fed. Cir. 1991); In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); In re Wilson, 165 USPQ 494, 496 (C.C.P.A. 1970).

It is respectfully submitted that the combination of references fails to teach or suggest all of the claim limitations as set forth in independent claim 10.

The present invention discloses a vertical-mount electrical power distribution plugstrip that frees up vertical rackmount space for other equipment. The plugstrip also allows a network console operator to control the electrical power status of a router or other network device.

Amended claim 10 recites a combination of features, including for example, *inter alia*, a plugstrip having a length longer than its width, and a user display disposed on the plugstrip and adjacent to the plurality of power outputs.

In contrast with amended claim 10 of the present invention, Schreiber discloses an intelligent power switching system for controlling the electrical connection of a power source to a plurality of outputs. Remote control unit 14 comprises six light emitting diodes (LEDs) 27a-27f that indicate when power is being applied to a particular system. Power strip 16 is connected via an electrical cord 30 to a wall outlet 28 for providing current to six outputs or outlets 32a-32f. See column 3, line 56 to column 4, line 11.

However, Schreiber does not disclose at least the features of paragraph E. of amended claim 10 of the instant application, namely, a user display disposed on the vertical strip enclosure and adjacent to the plurality of power outputs, the user display providing information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

Even *assuming arguendo* that the LED displays 27a-27f in Schreiber are disposed on a face of the remote control unit 14 that is connected to the power strip 16; the LEDs 27a-27f are not disposed on the same enclosure 16 and adacent to the outlets 32a-32e as recited in amended claim 10 of the present invention. Further, the remote control unit 14 is not a plugstrip as described in the present invention. In fact, the remote control unit 14 is a separate and distinct enclosure from the power strip 16 in Schreiber.

The Examiner correctly states that Schreiber does not disclose a user display, and cites Lovernich as curing the deficiencies of Screiber.

In further contrast with amended claim 10 of the present invention, Lovrenich teaches an addressable communication port expander. Figure 1 shows a plurality of remote peripheral devices including a digital ammeter 24. The addressable computer interface 30 receives an address signal from the computer 32 in order to determine with which of the remote peripheral devices 20, 22, 24, 26, or 28 to establish a bidirectional data communication path. As an example, if the computer inquires the present voltage measurement from voltmeter 22, the voltmeter 22 would then transmit a data signal which represents the measurement through the interface 30 for reception by the computer 32. See column 6, lines 29-59.

Although the peripheral devices, including digital voltmenter 22 transmit data which represents the measurement regarding voltage, the digital ammeter 24 is not disposed on a face

of any vertical strip enclosure. In fact, digital ammeter 24 merely peripherally interfaces with a computer and there is no discussion of a plugstrip or power outlets anywhere in the reference.

Applicants respectfully submit that Schreiber and Lovernich do not teach or suggest the above features of amended claim 10 of the present invention. The Applicants therefore respectfully submit that the claims as presently presented patentably define over these references taken alone or in combination.

There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify or combine reference teachings. See MPEP 2143.01. Applicants respectfully submit that there is no suggestion to modify or combine the two teachings. Schreiber teaches controlling an electrical connection of a power source to a plurality of outputs. See Abstract. Whereas, Lovernich teaches providing a computer interface for a plurality of addressable multiplexed output ports to interface with remote peripheral devices. See column 3, lines 8-14. Therefore, Schreiber teaches controlling power, while Lovernich teaches computer interfacing. Thus, Applicants submit that there is a lack of suggestion of the desirability of combining these two references.

Since, as claims 11-23 depend from claim 10, these claims are also allowable. In addition, Applicants respectfully submit that since claims 26 and 28 depend from claim 24, they should not have been including in this rejection. However, the arguments below corresponding to dependent claims 26 and 28.

Accordingly, reconsideration and withdrawal of the rejection of claims 10-23, 26, and 28 under 35 U.S.C. § 103(a) is respectfully requested.

Rejections under 35 U.S.C. § 102(b)

The Examiner rejected claims 24, 25, 27, and 29-32 as being anticipated by Shreiber. Reconsideration and withdrawal of the rejection is respectfully requested.

The test for anticipation under section 102 is whether each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); MPEP §2131. The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989); MPEP §2131. The elements must also be arranged as required by the claim. *In re Bond*, 15 USPQ2d 1566 (Fed. Cir. 1990).

It is respectfully submitted that Shreiber fails to disclose each and every element as set forth in independent claim 24.

Amended Claim 24 recites a combination of features, including for example, *inter alia*, a plugstrip having a length longer than its width, and a digital display disposed on another area of the plugstrip and ajacent to the plurality of power outputs.

As discussed above, regarding amended claim 10, Schreiber does not disclose a current display. Further, although the LEDs 27a-27f in Schreiber may be displays, they do not display current and are not located on the enclosure 16 with the plurality of power outlets 32a-32f as recited in amended claim 24.

Applicants respectfully submit that Schreiber do not disclose each and every element as set forth in amended claim 24 of the present invention. The Applicants therefore respectfully submit that the claim as presently presented patentably define over this reference taken alone or in combination.

Since, as claims 25-32 depend from claim 24, these claims are also allowable. Accordingly, reconsideration and withdrawal of the rejection of claims 24, 25, 27, and 29-32 under 35 U.S.C. § 102(b) is respectfully requested.

CONCLUSION

In light of the foregoing, Applicants submit that the application is now in condition for allowance. If the Examiner believes the application is not in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney if it is believed that such contact may expedite the prosecution of the application. Favorable action with an early allowance of the claims is earnestly solicited.

Respectfully submitted,

NATH & ASSOCIATES PLLC

Gary M. Nath
Registration No. 26,965
Gregory B. Kang
Registration No. 45,273
Teresa M. Arroyo
Registration No. 50,015
Customer No. 20529

Date: December 10, 2004
NATH & ASSOCIATES PLLC
1030 Fifteenth Street, N.W.
Sixth Floor
Washington, D.C. 20005-1503
Tel: (202) 775-8383
Fax: (202) 775-8396

RCR:slm 05/06/05
PATENT

Attorney Reference Number 7273-70199-01
Application Number 09/930,780

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Ewing et al.
Application No. 09/930,780
Filed: August 15, 2001
Confirmation No. 3325
For: VERTICAL-MOUNT ELECTRICAL POWER DISTRIBUTION PLUGSTRIP
Examiner: Ashokkumar B. Patel
Art Unit: 2154
Attorney Reference No. 7273-70199-01

CERTIFICATE OF FACSIMILE

I hereby certify that this paper and the documents referred to as being attached or enclosed herewith are being sent by Facsimile, Facsimile Number: 703-872-9306, addressed to: COMMISSIONER FOR PATENTS, on the date shown below.

Sheryl Mohler

Date Mailed May 6, 2005

COMMISSIONER FOR PATENTS
P.O. BOX 1450
ALEXANDRIA, VA 22313-1450

RESPONSE TO NOTICE OF NON-COMPLIANT AMENDMENT

This responds to the Notice of Non-Compliant Amendment dated March 11, 2005. As per the Notice at 4(A) (E), Applicants respectfully submit a complete listing of all of the claims, including all cancelled claims.

Applicants also submit a Request for a One Month Extension of Time.

LISTING OF CLAIMS

1-9. (Cancelled).

10. (Currently Amended) An electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination:

A. a vertical strip enclosure having a ~~long~~ thickness, and a length ~~and relatively thin~~ that is longer than a width of the enclosure;

B. a power input penetrating said vertical strip enclosure;

C. a plurality of power outputs disposed along a face of said ~~long~~ length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads;

D. a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs; and

E. a user display disposed on said vertical strip enclosure and adjacent to the plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, ~~whereby~~ said user display providing information to a user, the ~~a user may observe~~ information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

11. (Previously Presented) The electrical power plugstrip of claim 10 further comprising at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays.

12. (Previously Presented) The electrical power plugstrip of claim 11 further comprising an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

13. (Previously Presented) The electrical power plugstrip of claim 10 further comprising a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs.

14. (Previously Presented) The electrical power plugstrip of claim 13 further comprising an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

15. (Previously Presented) The electrical power plugstrip of claim 10 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

16. (Previously Presented) The electrical power plugstrip of claim 13 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

17. (Previously Presented) The electrical power plugstrip of claim 14 wherein the user display is in current determining communication with all among the plurality of power outputs through at least one current sensing device.

18. (Currently Amended) The electrical power plugstrip of claim 11 wherein said intelligent power section [[10]] comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

19. (Previously Presented) The electrical power plugstrip of claim 12 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

20. (Previously Presented) The electrical power plugstrip of claim 13 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

21. (Previously Presented) The electrical power plugstrip of claim 14 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

22. (Previously Presented) The electrical power plugstrip of claim 16 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

23. (Previously Presented) The electrical power plugstrip of claim 17 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

24. (Currently Amended) An electrical power distribution plugstrip of the type for providing power to one or more electrical loads in a vertical electrical equipment rack, the electrical power distribution plugstrip comprising in combination:

A. a vertical strip enclosure having a ~~long~~ thickness, and a length ~~and relatively thin~~ that is longer than a width of the enclosure;

B. a power input penetrating said vertical strip enclosure;

C. a plurality of power outputs disposed along an area on a face of said ~~long~~ length of the strip enclosure, each among the plurality of power outputs being connectable to a corresponding one of said one or more electrical loads; [[and]]

D. a plurality of power control relays disposed in said vertical strip enclosure, each among said plurality of power control relays being connected to independently control power from said power input to one or more corresponding power outputs among said plurality of power outputs; and

E. a digital display disposed on another area of said vertical strip enclosure and adjacent to said plurality of power outputs in information-determining communication with at least one among said power input and said plurality of power outputs, said digital display providing information to a user, the information being related to the amount of current flowing through at least one among the power input and said plurality of power outputs.

25. (Previously Presented) The electrical power plugstrip of claim 24 further comprising at least one intelligent power section disposed in the vertical strip enclosure and in which is disposed at least one of the plurality of power control relays.

26. (Previously Presented) The electrical power plugstrip of claim 25 further comprising an external power manager application external to the vertical strip enclosure in network communication with the intelligent power section disposed in the vertical strip enclosure,

whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

27. (Previously Presented) The electrical power plugstrip of claim 24 further comprising a plurality of intelligent power sections disposed in the vertical strip enclosure, each said intelligent power section being in independent communication with at least a corresponding one or more among the plurality of power outputs.

28. (Previously Presented) The electrical power plugstrip of claim 27 further comprising an external power manager application external to the vertical strip enclosure and in network communication with the plurality of intelligent power sections disposed in the vertical strip enclosure, whereby a user of the external power manager may control power provided to selectable ones of said plurality of power outputs.

29. (Previously Presented) The electrical power plugstrip of claim 25 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

30. (Previously Presented) The electrical power plugstrip of claim 26 wherein said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding power output for such one power control relay.

31. (Previously Presented) The electrical power plugstrip of claim 27 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

32. (Previously Presented) The electrical power plugstrip of claim 28 wherein each said intelligent power section comprises an intelligent power module having at least one of the plurality of power control relays and the corresponding one or more power outputs for such one power control relay.

RCR:slm 05/06/05
PATENT

Attorney Reference Number 7273-70199-01
Application Number 09/930,780

CONCLUSION

Applicants submit that the application is now in condition for allowance. If the Examiner has any questions or concerns about whether the application is in condition for allowance, Applicants respectfully request that the Examiner contact the undersigned attorney at 775-824-0104.

Respectfully submitted,

KLARQUIST SPARKMAN, LLP

By _____
Robert C. Ryan
Registration No. 29,343
775-824-0104

One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 595-5300
Facsimile: (503) 228-9446